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Conference May Aid Canadian Paper Interests

British Delegates Reported to Have Agreed to Give Substantial Preference In Home Market to Wide Range of Forest Products—Concessions Regarding Soft Lumber Would Benefit Dominion Pulp and Paper Concerns Materially—Quebec, Ontario and British Columbia, All Hit by U. S. Tax, Would be Provinces to Benefit

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 15, 1932—The Imperial Economic Conference is drawing to a conclusion, and at the time of writing success seems assured for a far-reaching plan of preferential trade between Canada and Great Britain. Details of this will not, of course, be made known until the conclusion of the Conference, but it is freely stated that the British delegates have agreed among other things to give substantial preference in the market of the United Kingdom to a wide range of forest products, among which is a market for 1,330,000,000 board feet of soft lumber. What, if anything, has been done in regard to pulp and paper is not disclosed, but as many of the large pulp and paper concerns have large lumber interests, the concessions regarding soft lumber will have important bearing on their fortunes. Quebec, Ontario and British Columbia, all of them hard hit by the new tax of $3 per thousand on lumber imposed by the United States, will be the principal provinces to benefit.

Big Overseas Orders for International

From Three Rivers it is announced that the production of the local mill of the International Paper Company will be doubled for at least the next two months, following the signing of two heavy orders, one from England, the other from Argentina. It is said that after severe tests the paper of the local shops was found superior and that this is partially credited to the quality of the water supply.

Mersey Mill's Successful Year

The Mersey Paper Company, of Liverpool, N. S., had a highly satisfactory year in 1931. The mill was operated at capacity for practically the whole period and both gross and net profits were substantially higher than in the previous year. Bond interest before depreciation was earned over 2½ times and all other charges were well covered, leaving sufficient surplus to have paid preferred dividends fully.

Gross profit for the year totalled $1,093,573 as against $852,922 in the preceding fiscal period. This was accomplished by an intensive campaign to build up new markets in the face of a steady decline in the consumption of news print on the continent. Reserve for depreciation accounted for $250,000 compared with $240,000 in 1930 and reserve for contingencies set at $60,000, leaving $783,573 available for bond interest and which absorbed $450,109. The resulting net profit was $333,464. The balance carried forward from the previous year was $172,701, leaving a profit and loss surplus of $506,165.

The general balance sheet shows total assets of $14,282,567 up from $14,159,925 in 1930. Current assets are $59,000 higher at $1,462,330, of which receivables total $651,460 and inventories $807,622. Fixed assets are up slightly at $12,779,453.

Among the liabilities bank loans appear at $3,726,000, of which $3,000,000 are secured by first mortgage bonds outstanding to the extent of $5,000,000. Payables amount to $845,435.

Growing Market in Far East

The Hon. Herbert Marler, Canada's Minister to Japan, who returned here recently, stated that executives of the Powell River Company in British Columbia were chiefly responsible for developing Canada's increasing news print business with the Far East.

In 1930, recalled Mr. Marler, practically no Canadian paper was sold to Japan, but due to Robert A. Scanlon, of the Powell River Company, who conducted a trade mission there the following year Japanese buyers placed orders aggregating $2,000,000. This year the Canadian exports of news print to Japan promise to exceed that figure.

The Powell River plant is now operating five days a week instead of three, largely because of this increased volume of business.

China presents a fine opportunity for Canadian news print exporters, according to Mr. Marler, who says that last year China's purchases totalled $5,000,000, another million dollars being for kraft and coarser grades of paper.

"Those intending to do business with the Orient must send their own representatives there, as the Powell River Company has done," said Mr. Marler. "Personal contact in the Far Eastern countries is essential."

From Vancouver it is stated that companies such as Westminster Paper Company shipped large volumes of wrapping paper and specialties to Australia and New Zealand, but this business is now practically non-existent,

(Continued on page 19)

Demand for Paper Improving In Philadelphia

Growing Volume of Orders Reported by Manufacturers of Fine Paper and Specialties—Kraft Wrapping Paper and Bags Moving More Freely Since Quotations Declined—More Interest Displayed In Better Grades of Paper Stock and Rags

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., August 14, 1932—With widening of demand among paper dealers and mills there is every encouragement given to the industry in the outlook for the Fall. Dealers have been more active since the price reductions on kraft and bags, as consumers believe that present prices will not prevail long in view of the more optimistic outlook for business generally.

Manufacturers of fine papers and specialties report growing orders as August advances and while there is not the normal seasonal demand, customers report steadier buying by consumers of small lots to meet requirements as they show up in the day to day needs of customers. The mid-summer demand for hot weather specialties holds, as dealers are called on for drinking cups, towels, outing goods, fancy doilies, napkins, table cloths and like goods offered in widening variety of designs. The department stores have been giving entire departments over to the display of these fancy paper goods in table sets, paper spoons, napkins, fancy plates, picnic outfits and other seasonal lines which have proved profitable sellers throughout the summer period.

There is betterment shown in the market for paper stock of the higher grades and for some of the rag supplies, that would indicate mill stocking and broadening of operations among manufacturers, although prices continue to hold at rock bottom levels. The cheaper grades continue listless, while neglected by the manufacturers.

Kieckhefer Adds Electrical Units

There is being added to the cylinder paper machine in the Kieckhefer Container Company plant at Delair, N. J., just outside Camden, N. J., another General Electric sectional cylinder mould drive which enables a great saving in the life of felts. This cylinder paper machine is equipped with seven motors used to drive the cylinder moulds through reduction gears. The generator which furnishes power for the motors is belted to the line shaft and as the speed of the line shaft is changed to give a required speed in felt per minute, the voltage of the generator is automatically changed to correspond to the felt per minute and the cylinder mould motors change the speed of the moulds in the same manner as though they were belted to the line shaft, providing uniformity of operation.

Another innovation in operation of the machine is provided through the mounting on each vat of a waterproof case containing an ammeter and a field rheostat to control the individual cylinder mould motors. This is used to place the required load on each motor or to take the friction load of the cylinder mould off the felt and to adjust the felt for proper tension.

In addition the first press section is thrown in with the mechanical clutch in the usual manner for starting. A drum switch is operated from the clutch shaft and through rugged, accurate timing control, the cylinder moulds start and accelerate at exactly the same time as the first press. A drive of this kind does two things, increases the test strength and saves in felt cost. Where water is used with abundant bacteria, the felt life is much shorter in summer than in winter and a greater saving results. This cylinder mould drive takes the excess tension off the felt that is normally required to drive the cylinder mould and by thus increasing the felt life also decreases the time necessary for changing felts on a yearly basis.

The contract for the installation of this drive was secured by Frank E. Winslow, paper mill engineer for the Philadelphia office of the General Electric Company.

Matthias Paper Corp. Adds Koda-Pak

The Matthias Paper Corporation, 143 North 5th street, has added to its lines the Koda-Pak, a new transparent cellulose product put out by the Eastman Kodak Company, Rochester, N. Y. The new product comes in white and a variety of colors. The Matthias Corporation will represent the Koda-Pak in the Philadelphia trade and has stocked a complete assortment of colors ready for immediate delivery.

A. P. W. Paper Co. Acquires Warehouse

A Philadelphia warehouse has been acquired by the A. P. W. Paper Company, with offices at 12th and Chestnut streets. The new warehousing facilities are located in the Bailey Warehouse Building, at Delaware avenue and South street, and provides more convenient services for the Quaker City trade. The A. P. W. Paper Company formerly occupied warehousing space in Camden. The sales offices will continue at the 12th and Chestnut street address.

Aatell & Jones To Stock New Doilies

Aatell & Jones, manufacturers of doilies and paper goods used by leading hotels, clubs and restaurants, with plant and sales offices at 1314 South Howard street, has brought out a standard line of fancy doilies which will be stocked permanently. The new doilies are made of the same high grade quality and workmanship as those the firm has produced for its customers in all parts of the country. They are adapted to use of small tea rooms, restaurants and like places. The firm has decided to make these in stock designed to accommodate such trade. The doilies are made in parchments and bonds, in a variety of designs and colorings, with a full line of sizes in each design.

National Waterproofing Brings Out New Lines

The National Waterproofing Company, with executive offices in the Drexel Building, and plant in Camden, N. J., has brought out another new line of Burlap Backed Kraft, in waterproofed wrappers and of great strength, adapted also for lining purposes, which gives absolute protection against moisture and dampness. An entirely new product to the paper trade is the latest development of the National Waterproofing Company, called "Dry-Pack," which is a wrapping and lining paper reinforced with a saturated cloth and can be had in rolls or sheets. This product lays perfectly flat and is durable as well as moisture proof and is a heavy protective covering as well. It is kraft with reinforced saturation cloth built into the paper.

J. R. Howarth Paper Co. Adds Advelopes

Latest development of the American Writing Paper Company, in the way of a patented envelope which carries a house organ, advertising matter, and business letter, and envelope, all combined in single envelope and known as

the Advelope, has been added to the lines promoted by the J. R. Howarth Paper Company, 804 Sansom street. This new patented device has all the dignity of first class mail matter and can yet be used with savings as third class matter for direct mail advertising or business correspondence carrying three products of ad matter in single covering. It is patented as a letter head folder, with the first page containing the address, with corner card enfolded and an interesting letter message; with the second page adapted for sales letter and carries the firm's letter head while the third page can bear vital information about the product or boiled down summary of booklet's contents. This third page forms the envelope with an end opening and enclosure flap in which ad matter or booklet may be enclosed. These Advelopes are made to order with the printers or advertisers furnishing the letter, message, cards and booklets, or house organ, while the American Writing Paper Company makes up these novel combination envelopes to the distributor's orders after the printer or advertiser has supplied the paper dealer with the material to be included. The Howarth Company has been conducting a campaign among the local consumers and dealers for this newest patented envelope device.

Raymond & McNutt Adds Novel Score Cards

Raymond & McNutt, Sheridan Building, has added to its lines the newest in score cards, done up in loose leaf form and combining a leather pocket case which may contain business cards. These newest score cards for business usage are easily carried and inserted and drawn out as they are double scored so as to make them readily adjusted for extraction and filling in the case. They are known as the Ottenway Looseleaf Double Score Card and a case is given free with every 500 cards. There are grades in personal, professional and business cards, furnished in three sizes.

News of the Trade

The Paper and Bag Institute of Philadelphia will at its meeting on August 17, have under consideration the adoption of an official monogram and seal which will be the emblem of the organization. This seal will be given consideration of the members and action taken on its employment on the stationery and other material of the membership at this meeting.

With its line of tissues reduced, the White Washburn Company, Hinsdale, N. H., has been making offers to the trade through its representative H. Clark, now touring the section, an attractive proposition in the lower priced grades of sulphites. These cheaper grades of sulphites all have been adjusted to meet the markets of today and for the Fall stocking.

President Allen E. Whiting, of the Whiting Patterson Company, 320 North 13th street, who has just returned from a vacation at Cape Cod, Mass., states that the envelope division of his firm is showing a marked improvement over May and June and that July and August sales were in excess of the volume of those months. He also reports a great improvement in demand for fine papers generally and for box makers supplies in fancy cover papers.

Lyman Smith, who was long linked with the Philadelphia trade as superintendent of the Lang Paper Company, and later on the Pacific Coast, is now connected with the Cherry River Paper Company as manager of manufacture in the Richwood, Va. mills. The Cherry River Paper Company with executive offices in the Pennsylvania Building, is remodeling its 141 inch paper machine devoted to production of heavy papers and sulphite tag boards. A new Beloit is being installed in the Wet End.

Boston Paper Market Active

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 15, 1932—The paper market generally in Boston and New England sustains the more cheerful trend which recently developed. A member of a local house notes that the tone of the market has changed decidedly for the better. Accounts which had not been heard from for months are becoming active. Undoubtedly due to the reopening of mills in other industries more orders have been received than for a long time.

The greater activity applies to both fine paper and wrapping paper, with the present outlook bright as a whole. "The only ink on the floor," to quote a wrapping paper merchant, "is the No. 2 kraft situation." There is little change in the box board market, prices remaining at the same levels, but some of the trade feel that advances will develop in the not far distant future.

No. 1 soft white shavings are now quoted at 1.50 f.o.b. Boston, compared with a previous figure of 1.40, and white blank news at 1.05 @ 1.10, compared with a former range of 1.00 @ 1.10. No. 1 kraft, however, is quoted at .65 @ .75, against a previous range of .70 @ .80. Owing to a spectacular advance in the cotton market, cotton cuttings are likely to show some improvement in price. The price of spinning cotton has advanced almost 50 per cent in the last 30 days.

Awards for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 17, 1932—The following paper awards have been announced by the Government Printing Office.

Barton, Duer & Koch Company will furnish 500,000 pounds of 23¼ inch and 26½ inch rolls manila calendered tag board at 6.55 cents per pound, bids for which were received on July 15.

The same company will also furnish 1,000 pounds of red stereotype molding paper in 24 inch rolls at 10 cents per pound. The Mathers-Lamm Paper Company will furnish 5,000 pounds (5,000 sheets) of 26 x 38, No. 50 lined chipboard at 1.599 cents per pound. Bids for these items were received on July 18.

The Tarentum Paper Mills will furnish 1,205 pounds (1,000 sheets) of 74 x 44 high finish red sulphite paper at 7.25 cents per pound, bids for which were received on July 27.

The Whitaker Paper Company will furnish 10,000 pounds (100,000 sheets) of 75 per cent antique laid book paper at 8.21 cents per pound, bids for which were received on July 28.

The Aetna Paper Company will furnish 20,000 pounds of blue, green, pink and yellow sulphite writing paper at 4.94 cents and 6.19 cents per pound and Dobler & Mudge will furnish 20,000 pounds of the same at 4.23 cents.

Simplification for Folding Boxes

Simplified practice recommendation R127-31 covering folding boxes for use by department and specialty stores is now in print and can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each, according to an announcement by the division of simplified practice of the Bureau of Standards.

This simplification program, which was proposed and developed by the stores with the assistance of the manufacturers, provides 59 selected sizes of this type of box. These are to take the place of 262 sizes formerly in use as reported in a survey by the Department of Commerce.

Activities of Fox River Valley Paper Mills

Brown County Paper Co. Building New Plant At West DePere, Wis.—Principal Product of Mill Will Be Heavy Wrappings—Alterations Being Made to Modernize Kimberly-Clark Plant At Kimberly, Wis., and to Add to Its Operating Efficiency

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 15, 1932.—Construction work has been started by the newly organized Brown County Paper Company, West DePere, Wis., on a mill which is to be in operation sometime in November. It will be built on the site of the former DePere Paper Manufacturing Company, whose plant was destroyed by fire more than a year ago. The new concern was incorporated about two weeks ago and its officers are: Sam Clark, president; Mose Miller, vice-president, and Jack Reis, secretary-treasurer.

Equipment used in the former DePere company mill is being salvaged and reconditioned for use in the new plant. The paper machine, while damaged in the fire, has been overhauled and will be in first class condition. The boilers and engines were only slightly damaged and have been inspected and pronounced in good condition for use with the paper machine. Part of the boiler house is being rebuilt where it was damaged by fire.

The paper mill will be of brick construction, 40 by 300 feet in size. Thirty-two workmen are employed. They are employees of the former mill and are working without compensation until the mill is completed and in operation, after which they will be re-imbursed. Richard Wojahn, chief engineer, is supervising the work. The principal product of the mill was heavy wrappings.

Kimberly-Clark Improvements

Enlargement of the acid plant at the Kimberly-Clark Corporation's mill at Kimberly, Wis., is under way. Building operations will be in progress for the next three months, with 230 men employed. Alterations will be made to the old plant and extensive improvements made so as to modernize the plant and add to its efficiency and productive capacity.

Northern Paper Mills Busy

For the first time in several months, the Northern Paper Mills, Green Bay, Wis., has experienced an accumulation of orders. July was better than June, and August presents a decidedly favorable outlook. The demand for first quality products has held up well in comparison with the trend towards cheaper grades. One large customer is placing orders for ninety day stocks for the first time in months.

At the Hoberg Paper and Fibre Company, Green Bay, it is reported that current business is about normal with 1928 and 1929 production and sales. Sales held up well throughout the depression, except for a noticeable slump last spring. The latter half of July and the first week in August finds sales back again to an encouraging level. An improved sentiment is noted among buyers.

News of the Industry

Pulpwood and lumber needs of Wisconsin can be met by the maintenance of 7,000,000 acres of well-stocked and well-managed forests, according to a survey made by a special state committee studying this subject. Careful handling of the forests will enable the present acreage to supply all industrial needs, the committee finds. Productivity can be increased at least 50 per cent in the next twenty years by giving adequate fire protection and it can easily be doubled by intensive forest management, including the planting of unproductive areas, it is believed. There will be a period of unavoidable shortage during which mills will be obliged to seek part of their supply elsewhere but it will be partially met by mills operating on timber from scattered natural second growth stands and brought in by truck from areas within fifty miles.

Nekoosa-Edwards Paper Company, Nekoosa, Wis., planted the greatest number of trees of any private company doing reforestation work in Wisconsin this season, according to a report of the Wisconsin Conservation Commission. The company planted 1,600,000 trees on 1,600 acres. The total number of trees planted is 7,442,000 on 7,742 acres comprising the entire reforestation work done in the state in the spring of 1932.

The Tomahawk Kraft Paper Company, Tomahawk, Wis., planted 400,000 trees on 400 acres. The U. S. Forest service planted 94,000 trees on approximately 135 acres of land. Plantings this year were the largest in the history of the state, indicating that reforestation is fast assuming a major place in guaranteeing the future wood supply for Wisconsin paper mills and other industries.

George W. Mead, president of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., served as a member of the notification committee for President Herbert Hoover relative to his Republican candidacy for re-election. He was a guest at a buffet luncheon at the White House last week and attended a luncheon which was a prelude to the notification ceremonies.

Powell River Co. Changes

Re-organization in the executive staff of the Powell River Company, owners and operators of the Powell River Pulp and Paper mill, has recently been announced by S. D. Brooks, executive vice-president, with offices at Vancouver, B. C. R. Bell-Irving, who has been resident manager at the company's plant at Powell River, B. C., for the past thirteen years, has been appointed assistant general manager of the company. He will continue to have his quarters at the plant. Mr. Bell-Irving joined the Powell River organization after his return from service overseas.

J. Falconer, who has been associate resident manager at Powell River for the past nineteen years, and who has also had a distinguished overseas war service record, has been appointed resident manager. R. H. Scanlon, who was also associate resident manager, and a director of the company, has resigned his position, although he will continue on the directorate of the organization. P. Sandwell, who has been with the company for the past twelve years, will succeed Mr. Falconer in the position of assistant resident manager.

William Barclay has been appointed sales manager for the company, and will have his headquarters at the company's offices in Vancouver. He has been sixteen years with the organization. E. C. Lee has been appointed assistant to the executive vice-president and general manager. He will also be stationed in Vancouver. He has been with the Powell River Company for the past eleven years. A. E. McMaster, general manager of the organization, will continue at the head of the company.

English Firm to Make Paper Products In Toronto

E. S. & A. Robinson, of Bristol, to Make Paper Specialties, and May Manufacture Paper Boxes —St. John Power & Paper Co. Retains Big Contract With Publishing Interests In United States—Pulpwood Ready for Detroit Sulphite Pulp & Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., Aug. 15, 1932—The largest plant to be established in Canada since the boom days of 1929 will soon be doing business at 888 Dupont street, Toronto, where a vacant textile factory is being prepared for the reception of machinery for the British firm of E. S. and A. Robinson, of Bristol, one of the largest printing and lithographing firms in England. The firm, which is also a producer of paper products, including calendars, may also engage in the manufacture of paper boxes which is one of their leading lines in the Old Country, although this has not been definitely decided upon as yet. The firm is moving most of its machinery from England and will purchase other equipment on this side. They have been doing business in an export way with Canada for over thirty years. It is stated that 150 workmen will be engaged in the Toronto plant turning out printing, lithographing and paper specialties. There are 44,000 square feet of manufacturing space in the factory.

Considerable Time Before Payment

Some considerable time must elapse before the St. John Power and Paper Company, Ltd., will be able to pay the interest on its first mortgage bonds, according to information supplied by the company to the National Trust Company as trustee, following upon the non-payment on August 1 of the interest then due on the St. John company's bonds and debentures. The circumstances are fully explained in a letter being sent to the bondholders and debenture holders by the National Trust, in which there is stressed the advisability of such security holders electing committees to represent them, with a view to investigating and considering the situation. It is suggested that during the next three or four weeks names of the proposed committees might be put forward which would prove generally acceptable. The selection of the personnel of the committees will be followed by notification of certain proposals and of the calling of meetings of the security holders. Lake St. John Power and Paper Company advises that the ten-year contract with large publishing interests in the United States, referred to in the prospectus, issued in February, 1927, in connection with the sale of bonds and debentures, still remains in full force and effect, with adjustments as agreed upon with the publishers from time to time, and continues to stand in the name of the company. The company states that the fact that the revenues from this contract have been insufficient to prevent default taking place in the payment of interest on the bonds and debentures is due, in part, to the allocation from time to time to other companies for manufacture by them of a certain portion of the tonnage covered by the contract, which allocation the company advises was imposed upon it by the Newsprint Institute of Canada, and in part to the decline in news print prices.

Many Men Employed

Approximately 600 men have been given employment and more than $250,000 has been spent through contracts in the Port Arthur district in the cutting and peeling of pulpwood this season for the Detroit Sulphite Pulp and Paper Company and its affiliated company, the Driftwood Lands and Timber Company, Ltd., according to estimates made by the two companies. All work contracted for this peeling season, which is drawing to a close, has been practically completed. Of the total amount of more than a quarter million dollars, about $200,000 was spent by the Detroit Sulphite Pulp and Paper Company and the balance by the affiliated company. Work was given to approximately five hundred men through the dealings of the senior company and to about one hundred men by the Driftwood Lands and Timber Co., Ltd. The wood, which was cut and peeled this season, is now piled ready to be hauled to the rivers and lakes during the coming Winter and later to be loaded on boats for trans-shipment to the company's paper mill at Detroit next Summer. It is stated that $60,000 was disbursed to the Canadian National Railways for freight in hauling wood since April from the spur of the Driftwood company at Long Lac to Nipigon, where a crew of fifty men has been engaged in loading the wood on boats.

News of the Trade

John Stuart Construction Company, Hamilton, Ont., have been awarded the contract for the rebuilding of the warehouse of E. Pullin, Ltd., rag and waste paper dealers, in Hamilton, whose premises were recently destroyed by fire. Plans call for a three story building for the first addition and a two story structure for the second addition. Work is scheduled to commence at once.

Norman Bennett, of W. B. Bennett & Son, paper dealers, Front street, Toronto, has returned from a holiday spent on Georgian Bay. Marking his engagement to a popular Toronto young lady, Mr. Bennett Jr., was given a farewell party by his friends at the resort.

July News Print Production

Production of news print in Canada during July, 1932, amounted to 142,491 tons and shipments to 145,431 tons, according to the News Print Service Bureau. Production in the United States was 74,502 tons and shipments 76,857 tons, making a total United States and Canadian news print production of 216,993 tons and shipments of 222,288 tons. During July, 24,528 tons of news print were made in Newfoundland and 1,082 tons in Mexico, so that the total North American production for the month amounted to 242,603 tons.

The Canadian mills produced 192,936 tons less in the first seven months of 1932 than in the first seven months of 1931, which was a decrease of 14 per cent. The output in the United States was 71,923 tons or 10 per cent less than for the first seven months of 1931, in Newfoundland 7,346 tons or 4 per cent less, and in Mexico 1,768 tons less, making a North American decrease of 273,973 tons or 12 per cent.

Stock of news print paper at Canadian mills totalled 47,017 tons at the end of July and at United States mills 33,369 tons, giving a combined total of 80,386 tons compared with 85,681 tons on June 30.

Chicago Paper Market Practically Unchanged

Improvement of Commodity and Stock Prices Not Yet Reflected In Paper Industry — Demand for Book and Cover Papers Fairly Persistent—Kraft Wrapping Paper and Sulphite Bond Situations Easier—News Print and Ground Wood Papers Marking Time

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 15, 1932—Little actual change is noted in the Chicago paper market this week over last, although there is more talk about the depression being over than there has been for many months. The stock and commodity markets have evidently given rise to this belief but the actual results are reported as not yet forthcoming in the paper market. Krafts are unchanged, the price of 2.26½ being reported as compared to 3¼ and 3 before the break about two weeks ago. Demand is none too good in other markets and there are shaky spots, according to reports. One of these "spots," say representatives here, is the sulphite bond market.

Ground woods are very slow but have evidently hit upon some sort of basis from which recovery may be registered. Books and covers are said to be responding a bit better with some of the mills reporting appreciable orders that are helping. News print awaits the definite turn of business, with advertising commitments being held in abeyance until something definite comes along. The situation, however, is said to be brighter than earlier in the summer. The board market is dull although that industry is beginning to pay some special attention to production and employment problems which may bring it favorable attention. Wastes are at a record low, according to reports, with very little demand being in evidence.

New Interstate Carton Announced

Chicago trade journals this week received a communication from the Interstate Folding Box Company announcing a new carton and dealing with the protection afforded different products by paper board packages. The particular communication was directed toward the food products industry and listed seven improvements that food products manufacturers could expect from the use of paper board containers, namely: protection against air; protection against moisture; against grease, mold, odors, insects and against sifting. The material also lists expedients used in connection with its paper cartons to give the contents the seven improvements. The detailed explanation is given in plain language understandable to the user of cartons. Interstate also calls attention to the prevalent outstanding defects existing in paper packages as a proper risisting material and a means of hermetically sealing and points out what it has done to remedy these defects. It announces a specially processed board that combines essential elements for protection against air penetration; moisture penetration and grease penetration. Interstate also announces a mechanical means which effectively seals the edges and corners at the top and bottom glue laps of a carton; securely closing these openings against air and vermin penetration and keeping the contents hermetically sealed, "affording a greater degree of protection for the contents than before possible." The release is aimed for food products journals, but Meade Hyndman, the sales manager, states that "the new carton can be used to advantage by many other products requiring similar protections."

Kraft Situation Discussed

The Chicago Paper Association held its first meeting of August on August 9 at the Bismarck Hotel. Of major importance to those present was the situation in the kraft market where, according to reports, conditions have not improved during the past week. One commentator, on being asked if the market was as low as it could go, replied that "it could go lower. Where there is a disagreement you can't tell just what will happen." However, with commodity prices strengthening and favorable reports coming in from other lines, the coarse paper executives feel that the time is ripe for a build up that is certain to come.

Paper Salesmen's Activities

Still undetermined as to where they will hold their final, and largest, golf outing, the Middle West Division of the Salesmen's Association of the Paper Industry is postponing an announcement until after a "meeting of minds" at the August golf event scheduled for the Park Ridge Country Club on August 19. The Park Ridge club is a private one and comparable to Westmoreland for sportiness and many conveniences. According to Courtney Reeves, golf chairman, the record for attendance may be broken at the August event inasmuch as most of the salesmen have wound up their annual vacations—if any. Immediately following Labor Day the salesmen will resume their weekly luncheons at the Hamilton Club and prepare a program for the balance of the year.

News of the Industry

Phil Hanna, editor of the Chicago *Journal of Commerce*, seems to be paying special attention to the paper industry in his daily column, "The Round Table of Business." Recently Mr. Hanna wrote an optimistic report on Michigan mills and now adds another contribution which the paper industry in general will be glad to read: "Mr. William Bonifas, who has charge of the lumbering operations of the Kimberley-Clark Company, shows you another tract of timber of 169,000 acres as he walks you through miles of saw mills and lumber cut and piled neatly. Within the past week, Mr. Bonifas declares, there has been more inquiry for lumber than in the past three months . . . another company in this section is shipping 100,000 pairs of paper shoe insoles a day. The same company is testing a sport shoe made entirely of paper."

William S. Cary of Morris, Ill., in making a statement at a recent Chicago convention of retail merchants, known as the Interstate Merchants Council, called attention to the fact that the Morris Paper Mills had just received a large order and that 600 employes who have worked off and on, are now on a straight full-time schedule.

The Chicago Advertising Council held its annual golf tournament at the Glen Oaks Country Club on July 28. It was an all day affair and drew a number of paper executives as guests of the Council. One of the trophies up for competition was the Seaman Paper Company cup.

With the date only a month away, the Chicago headquarters offices of the Paperboard Industries Association is busily engaged in making preparations for the September meeting of that organization scheduled for the 20, 21 and 22nd of the month. According to H. S. Adler, sec-

retary, considerable attention will be paid to the matter of a division of work and discussions as to whether or not the industry should recommend a shortening of the day and week to the number of hours which will take care of employment will assume an important place on the program.

The R. R. Donnelley Corporation, Chicago, offers an interesting angle to the postage problem which paper executives will note with attention. The Corporation suggests that "with millions and millions of mailing pieces being withdrawn from the first class group and mailed as third class matter, it is obvious that first class matter will take on added dignity, prestige and pulling power." They suggest a small test mailing of identical pieces to similar names, sending half of the mailing under first class postage and the other half as third class matter, then letting the percentage of replies and the cost per inquiry or order settle the argument.

MAY AID PAPER INTERESTS

(Continued from page 13)

according to J. J. Herb, president of the company. The fact that Swedish exchange amounts to about 40 per cent on the dollar has wrecked the chances of Canadians from selling in that market without substantial preference.

Paper products such as fruit wraps are not on the preferred tariff, but news print, which enjoys a tariff advantage, is still selling well in that market.

Quebec Investment Co. in Liquidation

A petition in bankruptcy has been granted to Quebec Investment Company Ltd. Alastair A. Cowan, Montreal accountant, was named provisional guardian. The petition was presented on behalf of the company by J. P. A. Gravel, K.C. No statement on assets and liabilities of the company, a private corporation composed of members of the Price family, was made, but a creditors' meeting will be called shortly.

The annual report of Price Bros. & Co. revealed that large loans had been made to the Quebec Investment Company, Ltd., without the formal approval of a majority of the directors. The Quebec Investment Company, Ltd., has been a family trust for the Prices and J. Leonard Apedaile, former vice-president and general-manager of Price Bros. & Co., was the only director not a member of the Price family.

Price Bros.' Protective Committee

Harris, Forbes & Co., Ltd., of Montreal, are circularizing first mortgage bondholders of Price Bros. & Co., Ltd., as follows:

"Funds were not deposited for the payment of interest due August 1, 1932, on your bonds and steps are now being taken by us to form a bondholders' protective committee to act in your behalf for the protection of your interests in the situation.

"We will advise you more definitely later regarding this and then ask you to deposit your bonds with the committee so that they may proceed."

New Australian Paper Plant

News reaches here that a group comprising the Melbourne *Herald and Weekly Times* and associated newspapers plan to start the preliminary work during the winter of 1932 on a news print mill to be established in the Florentine Valley, in the south of Tasmania.

It is proposed to erect the plant in the vicinity of New Norfolk, where facilities exist for supplying the industry with hydro-electric power, and where ample supplies of fresh water are available for use in the manufacturing process. The valley contains a large crop of virgin timber, the stand being estimated at 868,138,000 superficial feet.

One of the two other companies, interested in Tasmanian pulp and paper possibilities—that which is experimenting with the project in the Huon district—has been stirred to activity by the announcement concerning the Florentine Valley scheme, and has applied to the State Government for an extension of the period during which it may hold concessions over certain land.

Lake St. John Situation

The National Trust Company, of Montreal, has issued a letter to holders of bonds and debentures of the Lake St. John Power and Paper Company following the nonpayment of interest due on August 1st. The letter says in part:

"We are advised by the company that under present market conditions it will have an assured operating income for the next two years substantially more than sufficient to meet all operating expenditures, but that some considerable time must elapse before the liquid position of the company can be sufficiently improved and its net earnings sufficiently increased to enable interest to be paid upon its first mortgage bonds.

"The company further advises that the ten year contract with large publishing interests in the United States referred to in the prospectus issued in February, 1927, in connection with the sale of the bonds and debentures still remains in full force and effect with adjustments as agreed on with the publishers from time to time and continues to stand in the name of the company. The company states that the fact that the revenues from this contract have been insufficient to prevent default taking place in the payment of interest on the bonds and debentures is due in part to the allocation from time to time to other companies for manufacture by them of certain portions of the tonnage covered by the contract, which allocation the company advises was imposed on it by the Newsprint Institute of Canada, and in part to the decline in news print prices. It is also stated by the company that since the formation of St. Lawrence Corporation, Ltd. the greatest care has been taken to preserve the assets of the company intact in its own ownership and control, and that there have been no allowances of tonnage, earnings or other benefits by the company to St. Lawrence Corporation Ltd., or any of its other subsidiaries.

"Under these circumstances it seems clearly advisable that the bondholders and debenture holders should elect committees to represent them respectively, with a view to investigating and considering the situation.

Dean Baker Speaks at Ranger School

[FROM OUR REGULAR CORRESPONDENT]

CRANBERRY LAKE, N. Y., August 15, 1932—The fourth annual reunion of the alumni of the State Ranger School was held here this week during which an elaborate program was carried out. The alumni organization was formed by the graduates in 1928 for the promotion of forest educational activities and the general welfare of the school. The program this year included a business session and an inspection of the college forest.

The meeting was concluded with a banquet which was attended by a number of prominent leaders in reforestation work. Dr. Hugh P. Baker, dean of the College of Forestry at Syracuse University, delivered the principal address and narrated some of the events that have marked the rapid development of the Ranger School. He discussed forestry as a means of assisting in solving the unemployment situation and told of a program that had been mapped out at a recent meeting of foresters in this state.

Making "Hard" Sheet of Straw Paper with Lime

By H. P. Bailey[1]

In the paper industry, it is common practice to use an alkali, preferably caustic soda, or lime and soda ash, or straight lime, etc., as cooking agents for preparing paper stock. In the straw paper industry many cooking agents have been used. The "old timers" tell us that soda ash was used first for preparing straw stock because of its cheapness. In the course of time, lime proved to be the most desirable cooking agent and was used in nearly every mill until the "hard" sheet of straw paper was demanded. At that time the mills switched to the so called "chemical cooks" such as caustic soda, lime-soda, sulphur, etc. All of these fancy cooks proved to be more expensive than lime.

Extensive Tests

A reliable lime company participated by making extensive tests investigating the merits of many cooking agents, and as a result of their work, they introduced a chemical cook called "Mag-Li-Cook 31" (Patent applied for). It is said that the chemical cook-made straw paper enabled the mills to hold their established trade and help obtain some new business, yet at the same time, it proved to be a great handicap. The handicap was higher manufacturing costs. To be a little more specific, it might be termed as—higher cooking costs.

Reviewing all of this, it can be said that the straw mills switched from lime, the cheapest alkali known to a higher priced cooking agent in order to make the "hard" sheet of straw. The box plants of course were happy to get the "hard" sheet because they could use a lighter weight liner and save money, on the other hand, the straw producers encountered a loss because of higher costs.

The Explanation

The question now is—can you make the "hard" sheet with lime? The answer is yes and here's the explanation.

The chemical cook is technically an alkali cook. An alkali is a material which in water solutions has the property of imparting to the solution a soapy feel and taste; the ability of turning red litmus blue, phenolthalien red, methyl orange yellow, etc.; and the power to neutralize an acid. These properties are essential to an alkali, and in the language of the chemist, are characterized in solution by the presence of the hydroxyl radical (OH).

Lime has the above properties. It is an alkali the same as soda ash, caustic soda, etc. The "strength" of an alkali (alkaline strength) is usually described on the basis of the power to neutralize an acid. The "causticity" as applied to an alkali (alkaline strength) is a qualitative property.

Alkaline and Caustic Strength

To picture the difference between the terms "alkaline strength" and "caustic strength", let us consider the following. If into a number of containers we added pure water and mixed in the first 24 pounds of magnesium lime, in the second 28 pounds of calcium lime, in the third 40 pounds of caustic soda, and in the fourth 53 pounds of soda ash, each solution will neutralize the same quantity of acetic acid. Hence, here we show magnesium lime has the highest "alkaline strength" per pound. One may think of "alkaline strength" as 10 men in each container who are capable of doing a certain desired work, but the number of necessary tools available in each case is different.

In the caustic soda container, there are 10 of the necessary tools, and, as all the men may work at the same time the job is quickly accomplished. We assume the men go home after performing their work. In the soda ash container there are 5 tools, so that only 5 men may work at the same time, but as soon as 5 men go home, 5 more immediately take up the tools and so on until the 10 men have performed their work. In the case of lime, let us suppose only 2 men may work at the same time and so on comparatively speaking. Note that the same amount of work is done in each case, but in the second and third instances a longer period of time is required.

Cooking Straw

Now let us use this same line of reasoning for cooking straw. First, the materials we use as cooking agents are alkalis. They all have the hydroxyl radical. In the example above we show 24 pounds of magnesium lime, 28 pounds of calcium lime, 40 pounds caustic soda, and 53 pounds of soda ash, each will neutralize the same quantity of a given acid. Putting this another way, let us assume the straw is our material to be acted upon chemically, then for a given quantity of straw, it would take 24 pounds of magnesium lime and so on up to 53 pounds of soda ash. On the other hand, we show that caustic soda will do its work in less time than other alkalis while lime requires the longest length of time.

The problem now is a very simple one. Knowing the above facts, we ask what is the cost of caustic soda, soda ash, and of lime. Caustic is the highest priced alkali. Ash averages around $24 a ton delivered while lime which is often spoken of as the "Queen of the Alkalis" is the cheapest and probably averages one-third the cost of Soda Ash or about $8 a ton f.o.b. straw mill. Therefore why buy $24 alkali or higher priced materials when $8 alkali will do the work, besides, you use less of the $8 material to cook a unit mass of straw than you do with the $24 material.

Low Cooking Cost

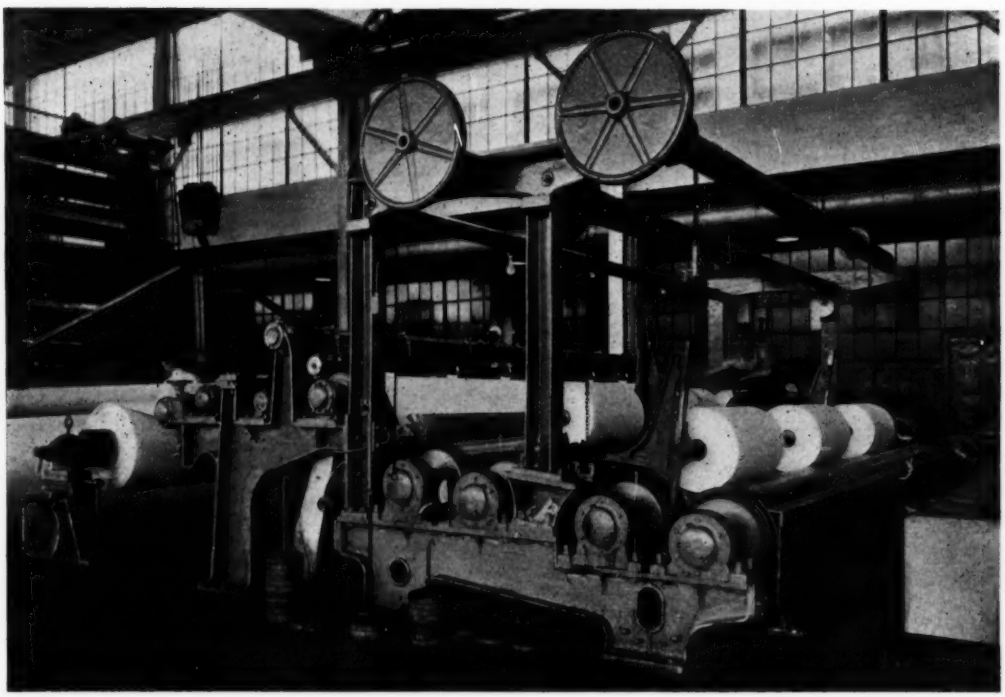
Lime is a slower acting alkali as we show above, but in cooking straw you proceed in the usual way and then age the stock in a pit 24 to 48 hours to allow the lime to continue its cooking action. About 900 pounds of a good, well prepared, tested, lime will cook a rotary of straw in the pit process. Figuring lime at $8 a ton or 4 tenths of a cent per pound, the total cooking cost would be but $3.60 per rotary. Aside from obtaining a very low cooking cost, the most interesting part of it all is, that you obtain stock which enables you to make the "hard" sheet of paper.

It is understood that two straw mills now cook with straight lime and then age their stock. Laboratory tests have been made on the paper from one of these mills and the crushing test (hardness) was found to be higher than the average lime-soda ash made paper. It is reasonable to expect that lime can make a paper having at least the same crushing test because after all we are cooking with an alkali and there is no reason why the hydroxyl

[1]Chemical Engineer, The Moores Lime Co., Springfield, Ohio.

The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

HIGH SPEED FOUR-DRUM WINDER & SLITTER



MOORE & WHITE HIGH SPEED all ball bearing equipped four-drum winder & slitter with quick removable ***bottom*** slitter blades in mill of Champion Fibre Co., Canton, N. C.—236" width of drums operating at a paper speed of 2100 feet per minute.

DESCRIPTIVE CATALOGUE
UPON REQUEST

radical in caustic soda, or any other alkali, should cook the straw any differently than the hydroxyl radical in lime providing proper allowances are made. The allowances as shown here are, to reduce the quantity of lime so that there is not a surplus, and, give the lime cooking agent a little more time to do its work.

To age stock, larger storage pits are necessary. However, since it is possible to make an altogether satisfactory grade of paper at lower costs with lime, then, why would it not pay to build an annex to your present pit in order to get the extra storage space.

An Interesting Question

Ask a straw man this question. What day of the week do you get the best "runs"? Monday is usually the answer and the explanation for this is—the stock made Saturday was allowed to age over Sunday. Therefore, if aging stock leads to better results, why not age all of the stock and at the same time switch to the cheapest alkali?

Of course if you use too large a quantity of chemicals, and this is true more so for soda ash, your stock is terrible. One experienced in the art of cooking straw will soon determine the correct proportions of lime to straw when you choose to age the stock.

As to machine operations, it goes without saying that the best paper and highest production can be made with lime cooked stock.

Advantages

Lime is therefore the agent you should use for cooking straw today.

(1) It is the cheapest cook.
(2) It is an alkali the same as caustic and ash and has the hydroxyl radical which is in a sense the cooking material.
(3) Pound for pound you can use less than other cooking agents to do the same amount of work.
(4) Tests show you can make the "hard" sheet of paper.
(5) Lime cooked stock gives the best machine performance.

Straw paper producers are urged to give this some thought. If the box plants hesitate about using lime cooked straw paper because it has the characteristic yellow color, even though the paper has a high crush test, darken the sheet by coloring with 1 to 2 per cent of ferrous sulphate (based on lime used). Other coloring materials of course can be used, but the point is, if the trade "thinks" the darker colored paper is better, then you can easily give them this kind of paper by adding a small amount of the above iron compound.

New Waldron Bulletin Out

The John Waldron Corporation, New Brunswick, N. J., has just issued a new bulletin No. 70 which pertains to their new silent all steel gears and gear blanks. These gears feature a patented method of construction that combines with the strength and long life of steel, the added advantages of the silent service and self lubrication. One of the chief claims made for these gears is the notable decrease in the number of shut downs due to broken teeth. They may be run mesh with each other with silence or in mesh with any gear commonly used as a mating gear for silent pinions. In their Bulletin No. 70 they present an interesting experiment that can be made by anyone to demonstrate the method by which silence in an all steel gear has been achieved.

New York Trade Jottings

Saxon Paper Products, Inc., of 15 Mercer street, New York, has increased its capital from $100,000 to $125,000.

* * *

The Uptown Card and Paper Company, of 150 East 129th street, New York, has increased its capital stock from $20,000 to $50,000.

* * *

Milcord Paper Company has been chartered under the laws of the State of New York with a capital stock of $1,000. S. J. Siegel, of 276 Fifth Avenue, New York, was the attorney.

* * *

John T. Harrison has been appointed to the sales department of the Northwest Paper Company, of Cloquet, Minn., as Eastern representative, with headquarters at 122 East 42nd street, New York.

* * *

The Chase National Bank, New York, as trustee, is notifying holders of Continental Paper and Bag Mills Corporation first and refunding mortgage 6½ per cent twenty-year sinking fund bonds, due February 1, 1944, that $62,893 is available for the purchase of such bonds at prices not to exceed 105½ and interest.

* * *

The Direct Mail Advertising Association Conference will be held at the Hotel Pennsylvania, New York, from October 5 to 7, inclusive. E. L. Wight, of the United States Envelope Company; and Ralph L. Harden, of the Mason Box Company; will be present to advise those interested on "How to Cut Mailing Costs and Solve Postage Problems."

* * *

E. Victor Donaldson, president of the Robert Gair Company, Inc., of 420 Lexington Avenue, New York, announces that the fiber board business of the Bogota Paper and Board Company, and the fiber shipping case business of his company, would hereafter be continued through a subsidiary of the Robert Gair Company, Inc. The management of the subsidiary will be: F. G. Becker, president; and Harold S. Smith, vice-president.

* * *

The Northwest Paper Company, of Cloquet, Minn., is adding three new Eastern distributors to stock its widely advertised Pedigreed papers. George W. Millar & Co., Inc., of New York, will now stock Northwest's Klokay English Finish, Northland English Finish and Northland S. and S. C. The Potter-Taylor Paper Corporation, of 39 Colonie street, New York, has been appointed to stock Klokay Eggshell Book, Klokay English Finish Book, Wilson English Finish, Wilson Eggshell Book, Northland English Finish and Northland S. and S. C. Vernon Bros. & Co., of 66 Duane street, New York, will carry Northland English Finish and Northland S. and S.C.

Paper Mill Employment Gains

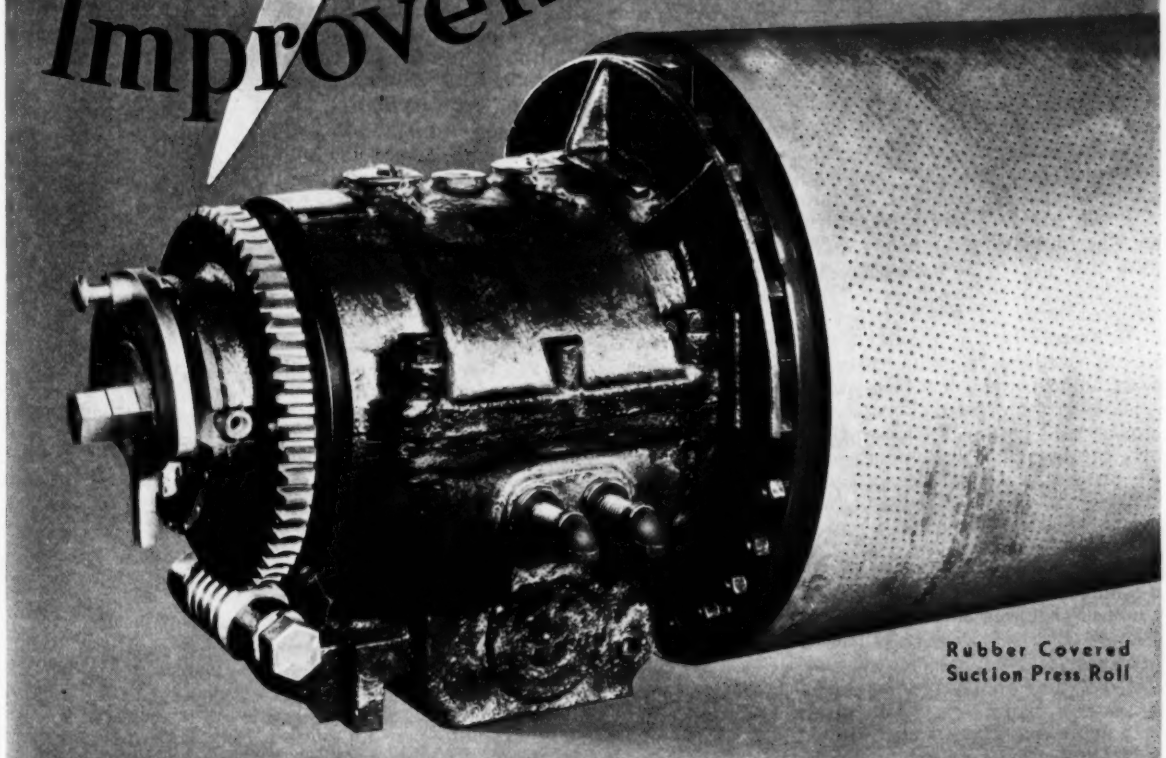
Increased employment and an end to wage-cutting in the paper, box-board and paper-box industries are indicated in a survey completed last week by W. Clement Moore, economist. Executives of 21 per cent of all plants reporting in the survey stated that they have in mind hiring a considerably increased number of employes in the Fall and Winter months.

"In the paper, box-board and paper-box trades," the report continues, "data obtained indicate that a 27 per cent increase in factory employes for October, November and December is contemplated. A 9 per cent increase in office personnel is also planned."

DOWNINGTOWN

Improvements

Two important changes have been made in the Downingtown Suction Roll, both of which make the front end much more compact. First, the suction connection was moved to the rear end, which saved several inches of overhang into the machine aisle. Then, the deckle, suction box and packing strip adjustments were redesigned and condensed. The front end of the roll is now practically flush with the sill plates of the machine, safe from damage by passing trucks. The Downingtown Manufacturing Company, Downingtown, Pa.



Rubber Covered Suction Press Roll

WE CAN "RUBBER COVER" YOUR OLD SUCTION ROLLS

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Kimberly, Wis.—The Kimberly-Clark Corporation, North Commercial street, Neenah, Wis., is said to be planning additional work at mill at Kimberly, where an expansion and improvement program in acid plant, estimated to cost over $75,000, will be carried out. New work includes other mill additions and repairs in certain departments, with installation of additional equipment. Estimated cost has not been announced.

New York, N. Y.—The Small Brothers Container Corporation, recently organized with capital of 100 shares of stock, no par value, is said to be planning operation of a local plant for the manufacture of paper boxes and containers. New company is headed by Samuel, Milton and Bernard L. Small, 647 Montgomery street, Brooklyn, N. Y.

Bogota, N. J.—The Bogota Paper and Board Corporation, recently organized under Delaware laws, with capital of $650,000 and 10,000 shares of stock, no par value, as reported in these columns recently, will be affiliated with the Robert Gair Company, 420 Lexington avenue, New York. It is said that the working quota will be increased at an early date. The new company is headed by Fred G. Becker, as president. William N. Smith, heretofore president and manager of the Bogota company, will be vice-president of the new organization. A. C. Hart, Hackensack, N. J., will be a director. E. Victor Donaldson is president of the Gair company.

Grand Rapids, Minn.—The Blandin Paper Company, First street, has awarded a contract for structural steel to the American Bridge Company, 629 S. E. Second street, Minneapolis, Minn., for superstructure for new power plant at local mill, for which general contract recently was let to the James Leck Company, 211 South Eleventh street, Minneapolis. Preliminary work has been started on the improvement, including clearing of site and foundations. Another award has been placed with the Foster-Wheeler Corporation, 165 Broadway, New York, N. Y., for boilers and certain auxiliary equipment. Additional awards for miscellaneous equipment will soon be made. Entire project is estimated to cost about $125,000, with machinery. Richard E. Lutz, Corn Exchange Building, Minneapolis, is consulting engineer.

Cleveland, Ohio—Industrial Rayon Corporation, West 98th street and Walford avenue, is reopening its local cellulose rayon mill, giving employment to about one-half normal working quota, following curtailment for a number of weeks. It is expected to increase the working force at early date. The company will also resume operations at its branch mill at Covington, Va., which was closed down about a month ago. Both plants will give employment to approximately 500 operatives.

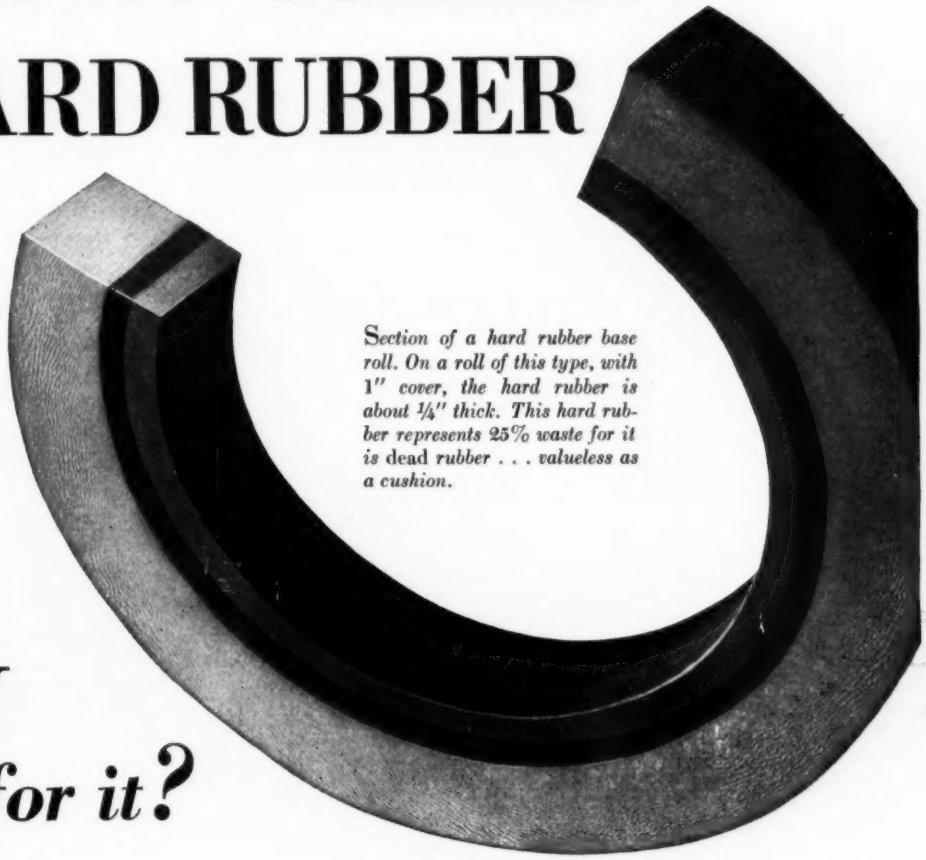
Plattsburg, N. Y.—In connection with expansion program of the Berst-Forster-Dixfield Company, Grand Central Terminal, New York, at its local paper products mill, referred to in last week's issue, it is proposed to construct two new three-story units, 152 x 210 feet, and 40 x 300 feet, respectively, with alterations and improvements in present buildings. The program also includes a new unit for filtration plant service. General contract has been awarded to the James Leck Company, 211 South 11th street, Minneapolis, Minn., which will soon take bids for different features of the construction program, including structural and reinforcing steel, steel sash, millwork, sheet metal work, etc. The entire project is estimated to cost close to $200,000, including equipment, and will provide for considerable advance in mill capacity. H. F. Hallock, Oswego, N. Y., is architect for company. The Berst-Forster-Dixfield Company is also carrying out a similar expansion program at wood mill at Cloquet, Minn., used for certain specialty wood production, awarding contracts similarly to the James Leck Company for three new two-story and basement units, 102 x 226 feet, 102 x 145 feet, and 81 x 102 feet, respectively. Work will be placed under way at once. Additional equipment will be installed. The entire program at the Cloquet mill is estimated to cost about $250,000, with machinery. Architect noted prepared plans for the project.

Hudson Falls, N. Y.—The Union Bag and Paper Corporation, Woolworth Building, New York, has closed its local Fenimore mill, due to labor troubles for several weeks past. It is reported that the closing is permanent, and that production will be carried out in another mill of the company. Later, it is said, the equipment at the Fenimore mill will be dismantled and removed to another plant.

Philadelphia, Pa.—The Ketterlinus Lithographic Manufacturing Company, Fourth and Arch streets, operating a paper lithographic plant, is increasing its production schedule, and is now running with night shift, in addition to regular day force. A number of employes have been reinstated.

Philadelphia, Pa.—National Container Corporation, Swanson street and Oregon avenue, is holding to a capacity schedule at its mill, with two ten-hour shifts per day, giving employment to large working force. This program has been operative at the mill for a number of months. The company is securing its supply of kraft paper from the new mill of the International Paper Company, Panama City, Fla. A recent consignment on the Gulf liner, "Commercial Alabaman," totaled about 1,500 tons, and another shipment will soon arrive on the steamship, "Commercial Navigator." It is said that the National company will use a total of about 20,000 tons of kraft paper stock from the Panama City mill during the next twelve months. Frederick R. Mann is vice-president and general manager of the National Container Corporation.

There's NO CUSHION in HARD RUBBER

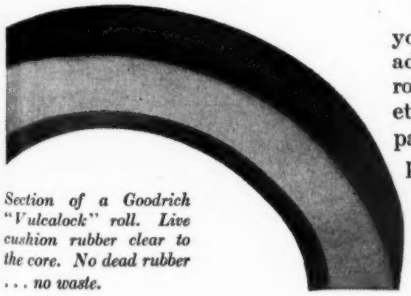


Section of a hard rubber base roll. On a roll of this type, with 1" cover, the hard rubber is about ¼" thick. This hard rubber represents 25% waste for it is dead *rubber . . . valueless as a cushion.*

WHY *pay for it?*

THE picture above shows a section of a typical *hard rubber base roll.* Its cover is ¾" cushion, ¼" hard rubber.

This ¼" of hard rubber is useful only to the *manufacturer* of the roll. It may be fastened to the roll's metal core. And in turn the cushion may be vulcanized to the hard rubber. An indirect method, but the only one possible . . . without "Vulcalock."



Section of a Goodrich "Vulcalock" roll. Live cushion rubber clear to the core. No dead rubber . . . no waste.

The hard rubber in this roll does you no good. You are paying for cushion. What do you get? ¼ less cushion . . . ¼ less wear . . . and a further loss when it's time to re-cover the roll. For hard rubber is *dead* rubber. It has no cushioning value.

To re-cover a hard rubber base roll you have to re-rough-thread, then add rubber to the cover to build the roll up to the correct outside diameter. So every time you re-cover, you pay for a thicker cover. On every point, the hard rubber base, a manufacturer's compromise, is your loss.

Now glance at the section of "Vulcalock" roll shown at the left. The difference is obvious. No compromise here. The cover is 100% live cushion clear to the core. It returns one hundred cents on every dollar . . . in cushioning . . . in wear.

An exclusive Goodrich development, the "Vulcalock" Roll is the *only* roll that does not have a hard rubber base. It is the *only* roll that makes unnecessary the vulcanizing of two different kinds of rubber at once . . . with the possibility of formula changes to make them adhere to each other. A "Vulcalock" cover can be compounded *exactly* to your specific needs.

Performance facts and figures describing "Vulcalock" rolls may be had for the asking. Address The B. F. Goodrich Rubber Company, (Est. 1870) Akron, Ohio.

B. F. Goodrich

VULCALOCK PAPER MILL ROLLS

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COMING EVENTS

Technical Association of the Pulp and Paper Industry, Fall Meeting, Nonotuck Hotel, Holyoke, Mass., September 14, 15 and 16, 1932.

FOREIGN PAPER TRADE

Exports of paper and paper products from the United States during the first half of 1932 were valued at $8,534,099—a decrease of 17 per cent compared with the preceding six months and of 30 per cent compared with the corresponding six months of 1931, according to the Paper Division of the Department of Commerce. Increases over the same period of last year occurred as follow: Greaseproof and waterproof papers ($500,878), 27 per cent; overissue and old newspapers ($794,505)—now the most prominent item in the paper export schedule—, 17 per cent; and surface coated papers ($372,661), 12 per cent, while exports of tissue and crepe paper and vulcanized fiber sheets, strips, rods and tubes showed only slight decreases. The heaviest decrease is recorded in paper hangings, which with a total valuation of only $62,733, showed a loss of 72 per cent, followed by wall board of paper or pulp, which declined 65 per cent, and blotting paper and sheathing and building paper, each of which were 60 per cent below last year's record. In the group which suffered losses from 45 to 50 per cent were included cover paper, paper towels and napkins, other paper board and fiber insulating lath or board, while losses from 35 to approximately 40 per cent are shown in box board, bristols and envelopes, paper bags, and papeteries. Exports of news print, cash register and book paper, not coated, each show a loss of 27 per cent, a notable feature of the last mentioned being that it showed an increase of 60 per cent to China and of 38 per cent to New Zealand. Toilet paper, filing folders, index cards and other office forms and paper bags, each registered a loss of 30 per cent, while cash register and adding machine paper was 25 per cent short of last year's record for the same period.

Exports of paper base stocks, with a total valuation of $1,536,374, for the period under review, showed a loss of only 5 per cent compared with the corresponding period of 1931. Exports of sulphite wood pulp were high. Amounting to $1,082,158 they represented an increase of 22 per cent over the first six months of last year. The heaviest decrease occurred in "other wood pulp", which amounted to only $7,262 and represented a decrease of 72 per cent, while soda wood pulp exports showed a loss of 28 per cent and those of rags and other paper stocks, of 22 per cent.

Imports of paper and paper products into the United States during the first six months were valued at $50,768,028—a decrease of 15 per cent compared with the preceding six months and of 23 per cent compared with the same period of 1931. Imports of news print were valued at $45,200,333, against $58,336,155 in the corresponding period last year. Imports of cigarette paper, books and covers, the next most prominent item in this group, were valued at $2,790,312, falling $781,507 short of last year's figure for the first six months.

In coming shipments of wrapping paper, writing and drawing paper, uncoated paper, decorated or embossed, writing paper and envelope combinations, surface coated papers, tissue and crepe papers, pulp board in rolls, paper board, pulp board and card board, hanging paper, duplex decalcomania paper, not printed, paper boxes and papier-mache and pulp manufactures were considerably lighter, but our imports of leatherboard, test and wall board, with a valuation of $54,382, showed an increase of 37 per cent, and those of kraft wrapping paper, with a valuation of $95,386, of 22 per cent.

Imports of paper base stocks during the first half of the years amounted to $28,138,081, compared with $39,919,893 in the preceding six months and $35,273,393 in the corresponding period last year. Imports of pulpwood, which were valued at $2,102,638, represented a decrease of 46 per cent when compared with the same period last year. While the quantity of unbleached sulphite wood pulp was practically the same as last year, the valuation ($9,058,625) showed a decrease of 18 per cent. Huge increases in our imports of this commodity from Germany and Norway are shown, while those from Canada and Sweden show heavy decreases. Bleached sulphite pulp also showed very little fluctuation in quantity, but the valuation ($7,715,165) was 22 per cent short of last year's figure, the shipments from Norway being valued at 45 per cent more and from Finland 30 per cent, while from Canada and Sweden they were considerably lower.

Imports of sulphate wood pulp, unbleached, were high, both in quantity and value. They were valued at $5,484,316, an increase of 15 per cent over last year for the same period, the incoming shipments of this product from Canada suffering a heavy loss, but being considerably heavier from Finland, Norway and Sweden. Bleached sulphate pulp imports ($1,020,161) represented a decrease of 20 per cent, there being an enormous decrease in the quantity coming from Sweden, amounting to only $5,913,

against $254,300 last year, while those from Finland were short of last year's record by more than 50 per cent.

Soda pulp imports were valued at $46,419, or a decrease of 55 per cent, while ground wood pulp suffered a loss of 22 per cent for the unbleached and 10 per cent for the bleached.

Imports of rags for paper stock were valued at $596,950 —a decrease of 30 per cent compared with the first six months of last year.

New TAPPI Members

The following elections to membership in the Technical Association of the Pulp and Paper Industry have been announced:

James A. Dean, chemist of the Fraser Paper Ltd., Madawaska, Maine, is a 1929 graduate of Boston College.

Carl Fahlstrom, chemist of the Longview Fibre Company, Longview, Wash., has since 1915 worked as chemist for the Kimberly-Clark Corporation, Kimberly, Wis.; Paper Converting Corporation, Niagara Falls, N. Y.; and the Thilmany Pulp and Paper Company, Kaukauna, Wis.

John J. Kolesinskas is a 1932 graduate of the New York State College of Forestry, Syracuse, N. Y. and formerly was employed by the Munising Paper Company, Munising, Mich.

Frederich Olsen, technical director of the Western Cartridge Company, East Alton, Ill., is a graduate of the University of Toronto in 1915. He was formerly in charge of the Emporium, Pennsylvania, Research Laboratory of the Aetna Explosives Company. and was technical advisor at the Picatinny Arsenal, Dover, N. J.

Barton W. Sawyer, is district manager of the Foxboro Company at Portland, Ore.

Frank H. Wheelock, plant chemist of the Vernon Division, Fibreboard Products, Inc., Los Angeles, Cal., attended the Georgia School of Technology. He was formerly chief chemist of the Semet-Solvay Company, Alton Park, Tenn., and department manager of the O. B. Andrews Company, Chattanooga, Tenn.

Arthur C. Zimmerman is manager of the Pacific Straw Paper and Board Company at Longview, Wash., and was formerly beater room foreman of the Mac Sim Bar Paper Company, Otsego, Mich., and superintendent of the Charles Boldt Mills, Cincinnati, Ohio.

Stillwater Fibre Mills Formed

STILLWATER, N. Y., August 15, 1932—A new concern known as the Stillwater Fibre Mills has been incorporated to manufacture paper products, fibrous minerals and other materials in this village. Harold R. Gillette, formerly president of the Gillette Fibre Mills, is the principal stockholder in the new concern which is capitalized at $50,000. Other stockholders include Benjamin Evans, Henry J. Determan, Julius Muffson and Michael Dubris. It is understood that the mills formerly used by the Gillette Fibre Mills will be used for production purposes.

Paper Firms Get Refunds

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 13, 1932.—The existing Internal Revenue has announced a refund of $97,441.64 to the Oxford Paper Company, New York City for overassessment of income tax for the year 1917.

Refunds of $121,098.33 for 1922 were made to the Crown Williamette Paper Company, San Francisco and of $340,539.95 to the same firm for 1923 for the same reason.

TAPPI Notes

Howard W. Morgan recently chemical engineer of the Oxford Paper Company, Rumford, Maine, is now a member of the instructing staff of the New York State College of Forestry, Syracuse, N. Y.

F. L. Barstow has been transferred from the Boston to the New York office of the U. S. Rubber Company, 1790 Broadway

Norman Clark has resigned his position as superintendent of the Gibson Playing Card Company, Long Island City, N. Y. and may be reached at 4005 Northrop street, Richmond, Va.

Wesley M. Osborne is no longer with the Puget Sound Pulp and Timber Company and may be reached at 301 L Street, Hoquiam, Wash.

Robert E. Cooper, formerly of the Spanish River Pulp and Paper Company is now chief chemist of the Foster Paper Company, Utica, N. Y.

Gilbert L. Clark, formerly vice-president of the Smith Paper Company, Lee, Mass., is now vice-president of the Standard Products Corporation, 21 W. 18th street, New York.

R. T. Petrie is no longer connected with the Minton Vacuum Dryer Corporation with whom he was master mechanic, and may be reached at 1505 Nichols Boulevard, Longview, Wash.

Charles W. Rivise, chairman of the TAPPI Patents Committee has recently published a book for patent attorneys, entitled, "Interference Practice and Procedure."

The proposed symposium on the use of starch in paper manufacture scheduled for the TAPPI fall meeting has been postponed until the annual meeting in February.

Ralph M. Snell, newly appointed chairman of the TAPPI History and Biography Committee is anxious to obtain a copy of Technical Association Papers, Series I. Anyone having a copy that he can give or sell to Mr. Snell should address him at the Hurlbut Paper Company, South Lee, Mass.

An index to the Technical Section of the PAPER TRADE JOURNAL, Volume 94, may be obtained on request by members from the Technical Association of the Pulp and Paper Industry, 370 Lexington avenue, New York. This index covers the first half of 1932.

Any chemist or chemical engineer in the paper industry who is unemployed should immediately register with the Committee on Unemployment and Relief for Chemists and Chemical Engineers, 300 Madison avenue, New York, Room 1004. TAPPI is one of the scientific societies sponsoring this committee. M. R. Bhagwat, former member of TAPPI, is an active worker on the volunteer workers committee.

Paper Mill Wages in Norway

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 13, 1932—The existing wage agreements in Norway will be continued in the paper industry until May 15 of next year according to the notice sent to the central labor organization by the employers association of the paper industry, according to a report from Commercial Attache Lund at Oslo.

The statement addressed to the labor organizations makes reference to the continued fall in market prices for the products of the industry, which would justify a readjustment of wages, but that such a step probably would not meet sympathetic understanding on the part of the workers. For this reason each member of the industry is asked to keep up production to the fullest extent possible under present difficult conditions.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

The Treatment of Paper Mill Waste Waters*

By G. E. Landt[1]

The most voluminous raw material of the paper manufacturing process is water.

In this use of water we are confronted with a situation that is unique in the structure of our industrial society. This raw material, water, unlike all others, is not a purchased commodity. It is borrowed; borrowed from the streams and rivers of the State, in which their ownership is vested. Return of this material to the owners is incumbent on the user. We might even say that its return is inescapable; for having used it, the manufacturer must get rid of it.

As an ethical ideal, we should prefer to return borrowed articles in the same condition as received. But unfortunately this ideal has not always inspired the users of the rivers and streams. In the early days of pulp and paper manufacture, as little thought was given to wresting from our streams and rivers, their beauty, their purity, and their health giving properties, as was generally given to despoiling our country of its natural resources.

Today, with a greatly increased population, definite heed must be paid to the health requirements of the owners from whom we borrow this water.

We are at once confronted with a dilemma. To return the borrowed article in the "as received" condition, would place such a burden on the industry that it would cease to exist, as would also the livelihood of many of those who share in the ownership of these rivers and streams.

Therefore, we who directly concern ourselves with this question, must find a pragmatic answer. When is dirty water clean and how much dirt can we put into our rivers and still keep the sportsmen, the sanitary bureaus, the women's clubs and the fish happy? Our responsibility involves social, economic, aesthetic and recreational questions, and it is not an easy one to define.

In terms of our social responsibility to the people of the commonwealth, we find that in many instances the communities of the commonwealth pollute their own water supply by discharging their sewage into the streams; and that such pollution is far in excess of that which paper mill wastes effect.

Aesthetically, a paper mill effluent can certainly do no damage to a stream whose unsightly banks beggar description wherever they are so unfortunate as to lie within the boundaries of our towns and cities, particularly in this section of Pennsylvania.

Piscatorially—well there we get into deep water. We, whose attitude on the question is entirely technical, have not yet been furnished with an adequate study of fish psychology so that we may know when and how to make the fish happy. For example—is water containing 2 ppm of dissolved oxygen necessary to sustain life in the more sluggish fish, such as cat and carp? If I were to maintain this, I would immediately be confronted with the fact that fish have been seen cutting high jinks in Schuylkill River water which showed absolutely no dissolved oxygen. I would be confronted with the fact that fish collect in schools around the waste outlet from our rag boilers, which is highly caustic, which contains 8 per cent of solids and which has a biochemical oxygen demand of 1500 with no dissolved oxygen present.

Very well, supposing we accept a dissolved oxygen or D. O. of 2 ppm as satisfactory can we feel that our responsibility to the fish and the State has been discharged? Decidedly not—such a standard would smack of class legislation, for trout would certainly not survive in this concentration of dissolved oxygen. On the other hand, did anyone ever hear of carp surviving in a trout stream? Carp, cat, perch or trout—which is it our responsibility to please?

Economically, it would seem an unwarranted duplication of plant, of effort, and of expenditure in general for each manufacturer along the stream to purify his effluent, when the job could be done so much more effectively, and so much more satisfactorily at central purification points, located at stated intervals along the river.

Purification of Waste Waters

Having no answer to these questions, we will, nevertheless, take off our coats and get to work on the problem of purifying our waste waters.

The problem of purifying waste waters in paper and pulp mills presents itself in an infinite variety of details. For simplification purposes we may first classify mill effluents on the basis of the type of pulp manufactured, as soda pulp, sulphate pulp, sulphite pulp, rag, waste paper and straw board pulp and paper. The first three of these pulps are frequently manufactured separately from the finished product. The manufacture of the second three pulps generally accompanies the paper making process. In the soda and sulphate pulp industries, cooking liquors are evaporated and incinerated for recovery and reuse of the contained chemicals. In the sulphite industry, evaporation of the cooking liquors to a high consistency is resorted to, where the local demands of the State Sanitary Water Com-

TAPPI SECTION, PAGE 67

* An address given at the April meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry, Philadelphia, Pa.

[1] Member TAPPI, chief chemist, Continental-Diamond Fibre Company, Bridgeport, Pa.

missions impose this procedure on the manufacturer and where an economic demand for the evaporated product as a bonding agent for molded parts, coal briquettes, etc., makes it pay. There has been a vast amount of work done towards finding industrial uses for sulphite liquor, but this has met with success in relatively few instances.

We have before us a tabulation of the waste waters of five Pennsylvania paper mills as a means of presenting a picture of the magnitude and variety of the problem.

TABLE I

Company	Stock	Suspended Solids ppm.	Biochemical Oxygen Demand ppm.	Volume in 24 hours, gallons
1	Main Effluent	110—215	1.08— 3.47	20,000,000
1	Paper Machine (Sulphite)	256—364	.15— .29	7,500,000
1	Wood Room	130—611	.27— 1.08	3,000,000
2	Sulphite & Ground Wood	145—510	30 —236	1,105,200
3	Sulphite & Soda	11—918	18 —1980	15,000,000
4	Machine Effluent	105—113	6.6 — 7.8	.....
4	Main Effluent	36—694	25 —383	.....
4	Dorr Overflow	31—41	1.0 — 1.58	.....
5	Main Effluent	.....	200 —400	1,250,000

In this table, B. O. D. refers to Biochemical Oxygen Demand, and will be explained later.

As a means of presenting a more detailed picture, the waste waters from our own mill, which operates largely on rag pulp, can be broken down into the following quantities:

From rag boilers	35,000 gallons per day.
From washers	1,100,000 gallons per day.
From thickeners after the rifflers	150,000 gallons per day.
From the paper machines	100,000 gallons per day.

Before going further into this question, it will be necessary to establish a criterion of purity or cleanliness so that we may have some measure of the extent of our sins and the degree to which we are successful in correcting them.

The presence of toxic and taste producing substances, such as phenol, cresol and other benzenoid hydro-carbons should be eliminated entirely from waste waters. These are special problems and fortunately do not occur in many paper mills.

Suspended solids, which are inorganic, need not concern us excepting in such rare instances where subsequent deposition of these solids may result in filling up stream beds. Inorganic materials are generally not noxious excepting when they are definitely toxic or when they consist of sulphurous compounds or other compounds which deplete the oxygen stored up in the water. Acids, however, when their quantity is great enough to change the natural acidity characteristics of the stream, must be considered as a nuisance. Mill effluents of highly acid characters are usually readily taken care of either by neutralization or by evaporation of the effluent and concentration of the acid. These types of wastes are, however, very rare in the paper mill.

Oxygen Demand

Dissolved and suspended organic materials furnish the chief source of disturbance from paper mill wastes. Such materials are subject to oxidation. In this, they consume oxygen. The oxygen dissolved in the water is thus depleted. Such oxygen is necessary for fish life. It also enables the river to purify itself. Rivers which have a high dissolved oxygen content in parts per million are pure, and this is, therefore, our criterion of a satisfactory or unsatisfactory condition of the stream.

As a corollary to this the biochemical oxygen demand, that is, the oxygen required by a given water to purify itself, is a criterion of the degree to which our plant wastes are noxious. Therefore, in a study of plant waste and river waters we will use the dissolved oxygen or D. O. and the biological oxygen demand or B. O. D. as our criterion of cleanliness. The B. O. D. can further be translated in a roughly empirical manner to the population equivalent of a given waste, that is, with a certain volume of discharge of a definite B. O. D. we may ascertain approximately the number of inhabitants who would discharge an equal pollution equivalent of sewage.

We will now return to a consideration of paper mill waste water. The waste waters from the different departments of our own paper mill, were separately analyzed. The B. O. D. of the rag boiler effluents, of the washers and thickener effluent combined, and of the paper machine, were as follows: 12,000—200 and 12 respectively, and the respective population loads were 17,500—10,250 and 500. We are thus able to classify these wastes separately as to their noxious qualities. We feel that we have made the first step here in the solution of our problem. We know where our wastes are, their amounts, and their relative nuisance.

Types of Save-alls

The treatment of white water wastes before returning them to the rivers and the streams presents a relatively simple problem, inasmuch as the principal pollution load consists of fibers. Recirculation of white waters is the simplest and most obvious method of reducing pollution. However, a completely closed system for recirculation is rarely feasible. The use of the save-all for reducing the fiber content of water which cannot be recirculated is very effective practice in further reducing the pollution load. Save-alls may be classified according to type, into filtering devices and settling devices. Filtration may be effected either by rotating a wire covered cylinder in a tank containing white water and collecting the fibres on the outside surface as the water passes through, or the white water may be fed inside of the cylinder, and the pulp collected from the inside surface as the white water passes through. Representative save-alls of each type are the Oliver and the North.

Sedimentation save-alls are differentiated principally by the means for collecting the settled pulp; one type possesses no such means but relies on the settling of pulp into a hopper with an overflow of clear water as a means for separation. Mechanical collection of the settled fiber is accomplished in circular tanks or in long, narrow tanks. The former are equipped with rotating rakes; the latter with an endless chain carrying scrapper bars. The former has been modified by one manufacturer to give a unit consisting of several superposed shallow tanks, each containing its rotating rakes and the whole system working in parallel. This adaptation is alleged to give a high degree of efficiency.

In Table II, we have compared the work done by the

TABLE II

Company	Type Save-all	Type Stock	Water to Save-all, gals. 24 hours	Water to Sewer, gals. 24 hours	Suspended Solids Initial	Suspended Solids Final	Reduction	BOD Initial	BOD Final	Reduction
1	North	Sulphite	500,000	387,000	3.3	2.3	29%	11	9.2	16%
2	.....	Sulphite & Soda	7,000,000	3,250,000	18.8	2.9	85%	24	16	33%
3	Oliver, Con. Filt.	Sulphite & Ground Wood	1,080,000	260,000	4—5	.4—.5	90%	60	35—40	33—42%
4	North	Rag	400,000	400,000	3.2	1.84	42.5%	20.9	11.9	46.9%
5	Sed. type	Sulphite	2,500,000	200,000	....	....	87%—90%	60—65	25—30	46—58%
6	Sed. type	Book papers	2,500,000	1,250,000	11.9	1.0	92%	20.2	10.82	46%
	Wire type	Book papers	.....	.....	18.8	6.40	70%	.....	.....	.....

save-all installations in a number of plants located in nearby Pennsylvania.

This table presents a great deal of pertinent information, namely, the pollution load of white waters as they are fed into the save-all; the amount that this load is reduced; and the amount of effluent which is fed to the save-all.

These figures are particularly interesting because they represent the performance of different types of save-alls, but they cannot be used as a criterion of the effectiveness of different designs because each machine is working on different stock and we should expect a wide variation of results on this basis alone. We feel that the save-all presents a very satisfactory answer to the question of handling the pollution load of white water waste. In mills where paper is manufactured from purchased pulp, the pollution from the paper machines constitutes the major pollution load of the plant. For such plants, save-alls give an effective answer to the question and usually pay for themselves while performing this service to the community.

We are also concerned in this discussion with those pollution problems presented by mills which prepare their own pulp from rags, waste paper, rope and straw. The process of cooking the pulps in a lime or otherwise alkaline liquor is common to most such plants, but the individual problems of each manufacturer with respect to the reduction of the pollution load of cooking liquors will vary considerably, and we feel it impossible to set up a simple system which would answer the requirements of any manufacturer.

In our own plant at Bridgeport, we have one of the hardest of such noxious wastes to handle, and in studying it we have considered the effectiveness and the operation of various systems of purification. I will present to you results and the important considerations obtained from studying these systems.

Rag Boiler Waste Waters

Boiler waste waters contain degraded cellulose which may be in true solution or in colloidal dispersion. They contain also residual alkali from the cook. This alkali makes their treatment difficult and expensive. A representative boiler waste water analysis is as follows:

Total Solids	7.6%
Organic Matter	5.9% (By ignition)
Sodium Carbonate	21.35 gms/liter
Sodium Oxide	8 gms/liter

From the standpoint of reducing the B. O. D., the problem consists in oxidizing or otherwise eliminating the organic matter.

As a first step in the handling of such wastes, it is important that they be diluted. The dilution of such boiler wastes with at least 80 per cent of other waste waters is necessary to bring about flocculation.

In treating boiler liquors of this kind, recourse may be had to a number of methods of treatment broadly diversible into physical methods and chemical methods. The best and most economical treatment will, however, invariably consist in a combination of two or several of these methods. The exact combination will depend on the nature of the waste water and the amount of the pollution load.

Dilution is invariably necessary as a first step in the treatment of boiler waters. Treatment of such waters as we encounter in our own practice without dilution results in the formation of solid jellies. Dilution of our boiler waste waters to at least 20 per cent of the original concentration, and preferably less, is necessary. Concentrations greater than this result in very little or no flocculation of the organic matter. Dilution of highly polluted waters has been recommended as a means of decreasing the B. O. D. without further treatment. To check this recommendation we combined a half dozen waste waters, each carrying a different pollution load, with out boiler waste. The pollution load of the resulting mixture was identical with the sum of the loads of the individual items in the mixture. This result is contrary to the opinions of many.

A second very necessary consideration in the treatment of waste waters is the pH at which such treatment is given. We have found that adjustment of the water to 5 pH is adequate for satisfactory flocculation, and it is as far in this direction as economic considerations permit us to go.

With the waste water satisfactorily adjusted as to concentration and pH, we are now confronted with a choice of methods of procedure. Our problem is further to remove the organic matter which may be done by flocculation and precipitation, or to oxidize it or otherwise reduce it so that it will not exert a demand on the dissolved oxygen of the river water into which it is introduced. To a chemist, precipitation with alum suggests itself as a ready means of effecting this end, and has been found by trial to be the most satisfactory. The amount of alum required will, of course, vary with the character of the liquor. The problem herein involved, however, is indicated by the solution worked out in our own laboratory.

Treatment of our rag boiler waste with 1.4 grams per gallon of sulphuric acid to give a pH of 5, and 30 grams per gallon of alum gave us a reduction in the population load of B. O. D. from 350 to 95 at a cost of $179.00 per day for chemicals. This, as can be seen, is not a satisfactory economic solution of the problem.

Oxidation of the waste in the liquors is a chemical method which would appear to lie within the realm of possibility. The bubbling of air through such liquors under the condition of our experiment seem, however, to have no appreciable effect on the B. O. D. If such liquors are allowed to stand in diluted form for a period of time, a very appreciable effect on the B. O. D. is noticeable. Samples which stood exposed to the air in the laboratory showed a reduction of 45 per cent after three hours. After twenty-four hours they showed a reduction of only 55 per cent, indicating that such materials as may be eliminated by standing were taken care of in a short period of time.

Other Means of Separation

There is also the biological method of attack in reducing the pollution load of such waste. Cellulosic materials are quickly attacked by certain organisms, and if these waste liquors are inoculated with sewage in treating basins, a very marked reduction of the B. O. D. is effected thereby. We have no data concerning this method of treatment of paper mill waste.

This problem also has aspects which require the introduction of mechanical means of separation. When flocculation is resorted to, sedimentation tanks or beds are required. In general it would seem that continuous types of sedimentation or clarifying tanks, should be required in order to provide for the elimination of the large amount of sludge which will be formed. In our own plant, such a sludge would equal about fifteen tons a day.

Filtration processes may also be called upon. Filtration through beds of coke, sand, gravel and cinders is suggested by some workers in this field. In most instances it seems that a pulp layer forms on the surface of the bed and, thereby, introduces a very effective filtration medium. We have found this to be true. The medium is so effec-

tive that nothing but clear water in very small amounts penetrates after several hours of operation, and while the Massachusetts State Board of Health report recommends this as a means of disposing of waste in rope and rag mills, we would hesitate very much to suggest this as a practical solution, excepting after careful trials have been made concerning its applicability to the problem in hand.

We feel that in this question of treating rag boiler waste, that we have merely touched on the principles which may be applied in reducing their pollution load. We would hesitate to recommend a standard practice in handling such loads. The present indications are that boiler waste from rag stock can best be handled by dilution with all other waste liquors from the plant, by neutralization of this waste water with sulphuric acid and subsequent exposure for six hours in shallow ponds or tanks; especially when such tanks have been seeded with sewage and subsequent discharge of the overflow to the river or streams.

We should like to point out in conclusion that any answer we give is so circumscribed economically that it cannot produce an effluent which equals the original river water in purity, and that no general answer can be given to those problems involving the cooking of rags and rope and the deinking of papers.

Study and Evaluation of Kraft Bleach Processes *

By Francis J. Cirves[1]

Summary

From the results of this investigation several pertinent facts are outstanding and are enumerated as follows:

1. Single stage bleaching yields pulp of highest alpha cellulose content. Table IV.

2. Single stage lime-chlorine bleaching is very effective and beneficial as to strength, color, and alpha cellulose content and is exceptional to all other enumerated summaries herein made. Table III.

3. In two stage bleaching 5 per cent Cl_2 basis bleach is more effective and beneficial in the first stage than 3 per cent Cl_2. Table III.

4. Two stage lime-hypochlorite bleached is superior in both color and strength although much more time is consumed.

5. Two stage bleaching yields pulp of superior strength and color, although lower in alpha cellulose content. Tables III and IV.

6. Large capacity bleaching is more beneficial as to color than small batches probably due to greater mass, compactness and better heat insulation.

7. Color relationship curves of Fig. 1 are helpful in determining point of maximum bleaching effects and ratio of per cent Cl_2 in multiple bleach stages.

8. Lime consumption curves of Fig. 2 predetermined for stock to be bleached are useful if alkaline bleaching is to be done and are also valuable in conjunction with bleach color relations. Fig. 1.

9. The method of studying bleach processes by means of "color rating," "stock rating" and "process rating" as well as "bleach efficiency" is exceedingly helpful and permits accurate comparisons of stocks and pulps taken at various times under various conditions.

10. The most rapid and economic single stage bleaching is the regular hypochlorite bleach which yields maximum color, strength, freeness, and alpha cellulose content when bleached with a per cent chlorine basis which yields the maximum "bleach efficiency" as determined from the bleach color relationship, Fig. 1 and Table III.

The kraft pulping process should be controlled with these points in view.

Introduction

In this investigation several principal methods of bleaching kraft are studied and discussed together with some other methods for the purpose of comparison and interest. Several theoretical considerations involved are brought forth and applied. It is hoped that some increased light may be shed upon the understanding of the bleaching of kraft. Above all a systematic attempt is made to evaluate the bleached kraft obtained by various methods so as to definitely determine the advantages and value of each. A method has been evolved which correlates both lightness of bleach and strength of pulp for comparative purposes.

Since kraft stock varies according to kind and source of wood as well as the method of cooking, bleaching economically and effectively can not be laid down by a simple rule and applied to all. The toughness or compactness of fibre and whether of a raw or hard cook, soft or well cooked stock, high or low in lignin content influences the results obtained. In this investigation some of these important points are disclosed which will indicate that bleaching is a selective problem applied to the particular kraft produced and must be studied much as is herein indicated.

The pulp used in this instance consisted of 50 per cent pine and hemlock of relatively low lignin content, each separately and fully cooked. The pulp was taken from the stock chests, squeezed dry, washed several times in fresh water and finally disintegrated, mixed and stored in an air tight pulp can at about 18 per cent consistency. The equivalent of 125 grams of bone dry stock was taken for each bleach, all processes being performed at room temperature in a stone ware jar at 5 per cent consistency. The contents were stirred intermittently by hand during the bleaching action.

After bleaching, the stock was squeezed dry and washed three times in about two gallons of fresh water which was sufficient to remove any alkalinity used in bleaching. The bleached stock was prepared for the ball mills to obtain the strength curve relationships. The method of preparing the test sheets was according to the Canadian standards.[2]

The methods or bleaching processes are tabulated and numbered and the amount of bleach used is expressed in per cent chlorine as a basis as follows:

No.	Single Stage Bleaching	Per Cent Cl₂
1	Hypochlorite bleach	8
2	Lime—hypochlorite bleach	8
3	Lime—chlorine bleach	8
4	Lime—chlorine bleach	11
5	Lime—HOCl acid bleach	8
No.	Two Stage Bleaching	Per Cent Cl₂
6	Hypochlorite bleach	5 + 3
7	Hypochlorite bleach	3 + 5
8	Lime—hypochlorite bleach	5 + 3
9	Lime—HOCl acid bleach	5 + 3

Before embarking upon the proposed processes as outlined the question arises of how much alkali or lime is consumed in alkaline bleaching. This applies to hypochlorite, chlorine, and hypochlorous acid bleaching.

Also since semi-bleached stock is of much higher strength than one fully bleached, a fair comparison of

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bleaching would necessitate the use of the degree of bleach or color. As a result, a series of tests were made both for alkali consumption and for degree of bleach or color.

These tests consisted of preparing sample hand sheets of stock which were bleached using 1-12 per cent Cl_2. High grade quicklime of known amount was hydrated in a 400 cc beaker by boiling. Upon cooling the equivalent of 5 grams of oven dry stock was introduced with a sufficient amount of additional water so as to obtain a 5 per cent consistency bleach when the required bleach solution was added. The contents were stirred during the bleach action after which the amount of free lime remaining was determined. This was done by titrating the lime as calcium monosucrose as follows:

Approximately 15 grams of table sugar were weighed into the bleach spent pulp sample and stirred in the beaker. The contents were diluted to 400 cc. with distilled water and stirred occasionally for an hour. The dissolved lime was titrated with standard hydrochloric acid, using phenolphthalein as indicator. This is an adaptation of a method for determining the hydrate in quick lime.[3]

The oven dried weight of the sample test sheets were used in calculating per cent lime and bleach consumption. See Table 5, Lime Consumption and Bleach Color of Test Sheets. Sets of sample sheets were obtained of a complete range of bleaches from 1-12 per cent chlorine.

Bleach Color Relationships

The four sets of test sheet bleaches are as follows:

1. Hypochlorite bleach ..... 1-12 per cent Cl_2
2. Lime—hypochlorite bleach ..... 1-12 per cent Cl_2
3. Lime—chlorine bleach ..... 1-12 per cent Cl_2
4. Lime—HOCl acid bleach ..... 1-12 per cent Cl_2

Of these sets it was discernible that bleaching by means of hypochlorous acid in the presence of lime offered a uniform gradation of bleaching from 0 to 12 per cent Cl_2 and therefore was used as a basis or a bleach color standard. The bleach colors obtained are plotted in Fig. 1, the standard lime-HOCl test sheets having been given a color number equivalent to the amount of chlorine used. The bleach colors were based on general lightness of the sheet and could be estimated with the eye to within one half a color number.

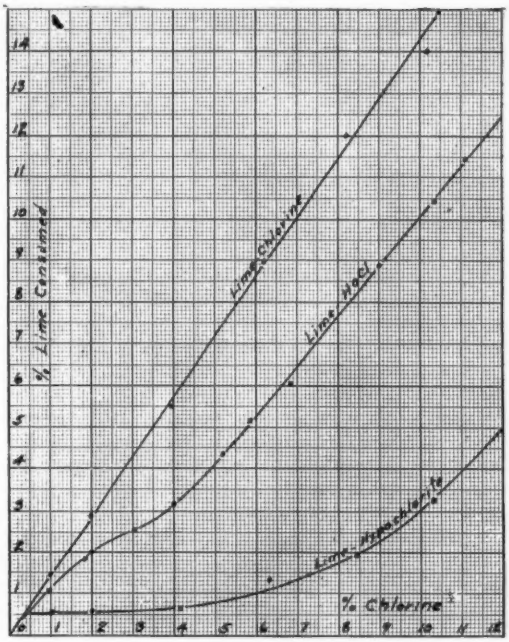

FIG. 2
Lime Consumption During Bleaching.

The hypochlorite bleach shows an inferior color rating up to nearly 6 per cent Cl_2. At up to 2 per cent Cl_2 no bleaching is effected. In fact the stock is considerably darkened and is arbitrarily numbered minus 1 at 1 per cent Cl_2. The darkening effects are not obviated until at 5½ per cent Cl_2 whence a rapid lightening takes place beyond that obtained ordinarily.

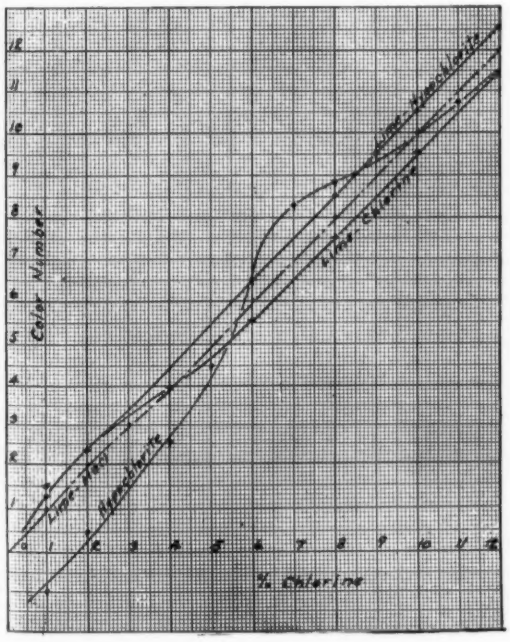

FIG. 1
Bleach Color Relations.

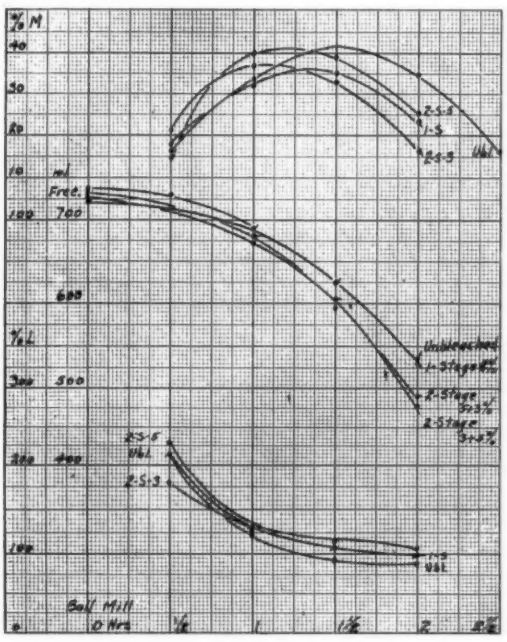

FIG. 3
Hypochlorite Bleach.

The hypochlorite bleach performed in the presence of lime shows no such fluctuations, the color being consistently one-half a color lighter throughout.

The chlorine bleach in the presence of lime gave a slightly subdued color above 4½ per cent Cl_2 though slightly higher up to that point. The general significance of the curves is that the lime-hypochlorite bleach is generally superior in color with exception at 6-9 per cent Cl_2 where the hypochlorite bleach is much better. Below 5 per cent Cl_2 the hypochlorite bleach is much below normal.

Lime Consumption in Bleaching

The lime consumed in a hypochlorite bleach is not a straight line function and does not amount to more than 5 per cent lime at 12 per cent Cl_2, Fig. 2. At up to 6 per cent Cl_2 not over 1 per cent lime is expended. This indicates that two to five times as much acid is formed at higher bleaches or at above 8 per cent Cl_2. It is not believed that the acid formed above 8 per cent has a stimulating effect on the color since it falls below normal above 10 per cent Cl_2. A possible explanation of the superiority of the hypochlorite bleach at 6 to 9 per cent Cl_2 is the chemical and low color reaction which takes place at low Cl_2 bleaches. In the region of low acidity a reddish lignin acid is formed which subsequently forms a dark calcium lignin chloride analogous to the formation of the dark or reddish calcium lignin sulphite as in sulphite cooking. The alkaline lignin chloride formation is apparently beneficial in the early stages of bleaching since the reaction is very efficient and upon subsequent bleaching is more easily removed and reveals a fibre much superior in color. Acid formation beyond this point appears harmful to the color. It would be advisable therefore to bleach up to the point where acid conditions set in if hypochlorite is used. This may vary somewhat according to kind of stock and lignin content and therefore the per cent chlorine required. At this point a lime wash may be beneficial preliminary to a following stage. A subsequent lime bleach may also be most suitable. This would be a third stage if two stages were employed to approximately 8 per cent Cl_2 at the point of increased acidity. The lignin content of this pulp was 5.6 per cent.[4] A different grade of stock with as high as 10-15 per cent lignin will undoubtedly show a different bleach color relationship as well as lime consumption for hypochlorite bleach.

The theoretical lime consumption in the preparation of hypochlorite bleach is 104.5 per cent; however, where pulp is subjected to chlorine water the consumption is 144 per

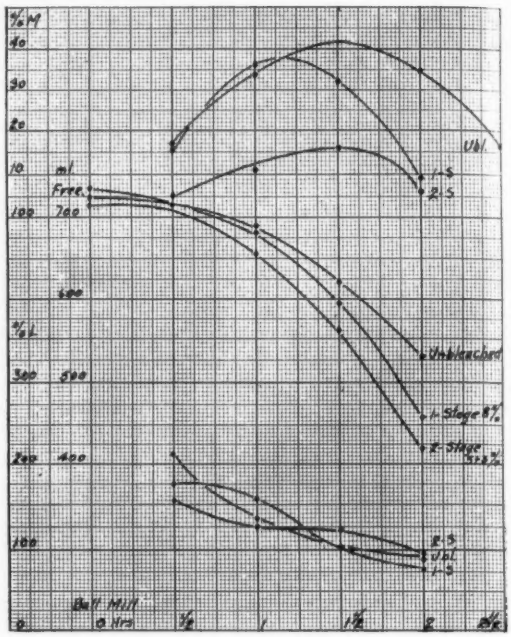

FIG. 5
Lime—HOCl Bleach.

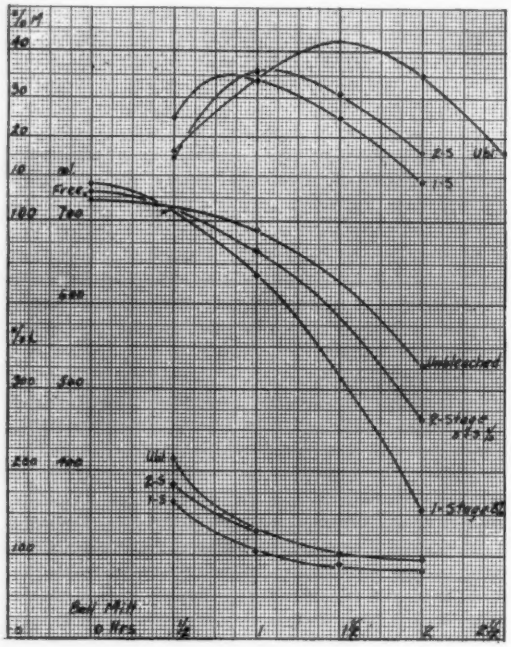

FIG. 4
Lime—Hypochlorite Bleach.

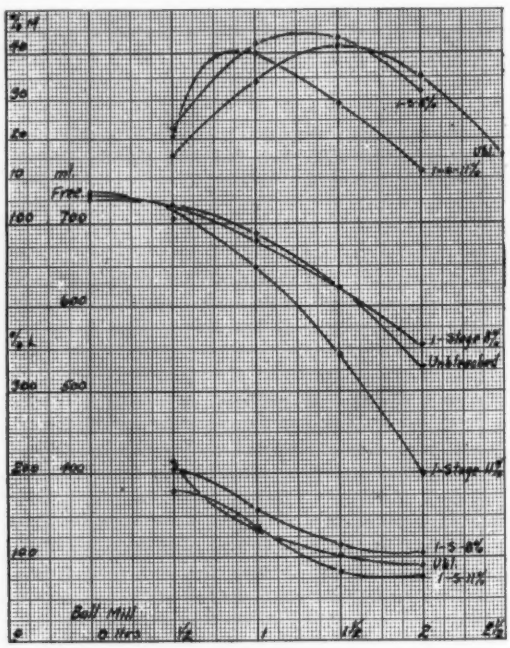

FIG. 6
Lime—Chlorine Bleach.

cent and is constant. Fig. 2. In bleaching, one and one-half times the amount of lime is used to per cent chlorine employed.

The theoretical lime consumption in the bleaching with hypochlorous acid is 70.7 per cent. On the straight line portion of the consumption curve it is 100.7 per cent. The amount of lime to be used was based on this relationship with a few per cent of lime as a safe excess.

Strength Relationships of Bleached Pulps

In obtaining strength tests of the bleached pulps, graphs were made of the freeness, per cent Mullen and Elmendorf relationships. These are compared to one another as well as to the original unbleached stock. Tear tests were made on tin formed oven dried sheets and Mullen on natural oven dried sheets. The accompanying Figs 3 to 5 inclusive are separately discussed.

Hypochlorite Bleaching

The single stage hypochlorite bleach 8 per cent Cl_2 curve has a maximum Mullen of 136 per cent while the two stage 5 + 3 per cent Cl_2 has a maximum of 141 per cent. The 3 + 5 per cent Cl_2 bleach has an intermediate maximum of 138 per cent. The 5 + 3 per cent Cl_2 bleach also yields a somewhat better freeness and tear at 2 hours than the 3+ 5 per cent Cl_2 bleach. The one stage has a much better freeness which is in its favor for subsequent processing for the production of paper. The 5 + 3 per cent Cl_2 bleach has a color of 9½ compared to 8½ the others.

Lime Hypochlorite Bleaching

As is again evident the two stage 5 + 3 per cent Cl_2 bleach of lime hypochlorite, Fig. 4, is superior to the single stage, the Mullen being 136 and 134 per cent respectively. In either case the maximum Mullen is somewhat lower than in hypochlorite bleaching. The bleach colors are 10½ and 8½. The 5 + 3 per cent lime bleach also has a better tear. Its freeness is much higher throughout ball milling which makes it considerably superior, more than is judged from the Mullen alone.

Lime—HOCl Bleaching

A single and two stage bleaching by the use of hypochlorous acid in the presence of lime yielded some interesting facts, Fig. 5. The single stage bleach has a Mullen equal to that of hypochlorite bleaching and better than lime hypochlorite bleaching, with a tear better than either. The freeness is also as good. The two stage lime HOCl bleach has dropped from 136 per cent to 117 per cent Mullen. Hypochlorous acid used was produced about five times the strength of saturated chlorine water; namely, about 30 grams per liter by passing chlorine gas through a suspension of carbonate of lime in water. A two stage bleach of this kind yields a color of 9½ compared to 8½ of the single stage system.

TABLE II.—STRENGTH RATING

No.	Process	Per Cent Cl_2	Color	Strength Rating	Per Cent Strength Rating
3	1—Stage Lime-Chlorine	8	7	99.0	107.2
6	2—Stage Hypochlorite	5 + 3	9½	94.8	102.7
7	2—Stage Hypochlorite	3 + 5	8½	94.3	102.1
0	Unbleached Kraft	0	0	92.4	100.0
4	1—Stage Lime-Chlorine	11	11½	90.4	97.8
8	2—Stage Lime-Hypochlorite	5 + 3	10½	90.1	97.6
5	1—Stage Lime-HOCl	8	8½	87.1	94.4
1	1—Stage Hypochlorite	8	8½	83.2	90.1
9	2—Stage Lime-HOCl	5 + 3	9½	93.1	90.0
2	1—Stage Lime-Hypochlorite	8	8½	82.6	89.4

Lime-Chlorine Bleaching

Bleaching by means of chlorine in the presence of lime yielded noteworthy results, Fig. 6. The single stage 8 per cent Cl_2 Mullen curve reaches a maximum of 144 per cent. The freeness generally has altered little and the tear relationship has advanced, being 130 per cent at the point of maximum Mullen compared to 95 per cent at that of the unbleached. Another lime-chlorine bleach at 11 per cent Cl_2 still maintained a Mullen close to the unbleached though the freeness and tear relationships have taken lower values at 2 hrs. No two stage bleach was made but very good results are to be expected. The 11 per cent Cl_2 bleach gave a bleach color of 11½ and the 8 per cent Cl_2 one of 7.

Comparative Resumé of Strength Data

To compare pulp strengths by maximum Mullen values alone is not sufficient. If the maximum has shifted to the left which is the case in Fig. 6, the freeness and tear values are usually higher. Such a Mullen curve will usually show a rapid falling off with also lower freeness and tear values at the two hour ball mill which would not be comparable to pulp of equal Mullen maximum occurring later and usually having a superior freeness and tear at that point. A two hour ball mill test should be included since it renders data which are a fair gauge as to pulp strength and its durability for further processing in the beaters and jordans. A certain freeness value attained is usually the minimum allowable for good processing. With lowering of the freeness, excessive hydration reveals in particular a lowering of the Elmendorf. Hence the strength evaluation of a pulp should be expressed by correlation with Elmendorf at the point of maximum and at the two hour period. The "Beater Value"[8] is the proper expression to be used at both these points. A "strength rating" is obtained as an average of the maximum and the two hour "beater values," "BV," as follows:

$$1) \quad \frac{\text{Max BV} + \text{2 hr. BV}}{2} = \text{"Strength Rating"}$$

TABLE I.—STRENGTH DATA

Bleach No.	Process	C.C. Freeness 0	½ Hr.	At Max.	At 2 Hr.	½ Hr.	Per Cent Mullen At Max.	At 2 Hr.	Time to Max.	Per Cent Elmendorf At ½ Hr.	At Max.M.	At 2 Hr.	Per Cent Strength Rating Max. Beater Value	2 Hr. Beater Value	St'gth Rating	Per cent St'gth Rating	Bleach Time Hrs.	Color	Alpha Cellulose
	1—Stage																		
1	Bleach 8%	738	739	675	529	118	136	98	71	231	108	89	95.0	71.3	83.2	90.1	2	8½	85.3
2	Lime Bleach 8%	740	716	660	352	126	134	92	54	165	112	83	95.0	66.8	80.9	87.6	15	8½	83.5
3	Lime Chlorine 8%	735	721	650	556	123	144	132	84	204	130	108	105.0	93.0	99.0	107.2	12	7	85.2
4	Lime Chlorine 11%	731	716	640	320	121	140	113	65	179	140	77	105.0	75.8	90.4	97.8	20	11½	84.3
5	Lime HOCl 8%	735	717	670	464	115	136	109	68	174	127	79	99.8	74.3	87.1	94.3	6	8½	83.7
0	Unbleached Kraft	725	708	620	532	116	142	135	93	214	95	90	94.8	90.0	92.4	100	....	0	86.4
	2—Stage																		
6	Bleach 5 + 3%	732	693	630	489	115	141	125	104	217	115	107	99.3	89.3	94.3	102.1	7¼	9½	83.2
7	Bleach 3 + 5%	727	699	660	475	121	138	118	68	180	125	102	100.0	89.5	94.8	102.8	4	8½	83.1
8	Lime Bleach 5 + 3%	729	722	662	467	115	136	116	65	186	123	93	98.8	81.3	90.1	97.6	14¾	10½	83.4
9	Lime HOCl 5 + 3%	716	726	540	422	105	117	106	94	156	117	97	87.8	77.3	82.6	89.4	6	9½	82.1

TABLE III.—PROCESS RATING

No.	Process	Per Cent Cl₂	Color	Bleach Efficiency	Color Rating	Strength Rating Per Cent	Process Rating	Bleaching Time—Hours
4	Lime-Hypochlorite 1—Stage	5 + 3	10½	131.2	137.9	97.6	134.4	14¾
6	Lime-Chlorine 2—Stage	11	11½	104.6	120.1	97.8	117.5	20
9	Hypochlorite 2—Stage	5 + 3	9½	118.8	112.8	102.7	115.3	7¼
7	Lime-HOCl 2—Stage	5 + 3	9½	118.8	112.8	90.0	101.3	6
5	Hypochlorite 1—Stage	3 + 5	8½	106.3	90.4	102.1	92.4	4
1	Lime-HOCl 1—Stage	8	8½	106.3	90.4	94.4	85.2	6
2	Hypochlorite 1—Stage	8	8½	106.3	90.4	90.1	81.5	2
3	Lime-Hypochlorite 1—Stage	8	8½	106.3	90.4	89.4	80.8	15
0	Unbleached Kraft	8	7	82.5	57.8	107.2	62.0	12
8	2—Stage	0	0	0	0	100	0	0

By this means the strengths of various pulps may be determined and directly compared. The bleaching processes are arranged in Table II according to "strength rating." From this it is seen that as for strength alone without reference to color the two stage hypochlorite bleaches are superior to others as well as the unbleached stocks which has a "strength rating" of 92.4. When at other times a different stock is employed the bleaches therefrom are still directly comparable if a "per cent strength" rating is obtained, the unbleached stock being rated as 100 per cent, last column of Table III.

The degrees of bleaching or the bleaching efficiencies of processes differ widely. If a process using 8 per cent Cl_2 basis bleach yields a pulp with a color of 8 compared to the standard it may be considered a 100 per cent bleach or efficiency; therefore:

$$2)\quad \frac{\text{Color No.}}{\%\ \text{Cl}} = \text{"Bleach Efficiency"}$$

A highly bleached pulp may have the same efficiency as a mildly bleached pulp. To evaluate a bleaching process without regard to color and only regard to strength would favor the milder or poorer bleach; therefore:

$$3)\quad \text{Bleach Efficiency} \times \frac{\text{Color No.}}{10} = \text{"Color Rating"}$$

$$4)\quad \text{Color Rating} \times \%\ \text{"Strength Rating"} = \text{"Process Rating"}$$

Table III shows the bleach processes arranged according to "process rating" which correlates both color and strength of pulp obtained.

It is now evident which bleach processes yield the maximum in color and in strength; in other words, the processes are evaluated. The two stage bleach processes are superior. The 5 + 3 per cent Cl_2 bleaches are better than the 3 + 5 per cent Cl_2. The two stage lime- hypochlorite is superior to the two stage hypochlorite. This is by reason of the better color obtained since in Table II the two stage hypochlorite is superior to the two stage lime-hypochlorite by reason of strength. The two stage lime-bleach has the disadvantage of requiring twice as much time; namely, 7½ hours as against 4¾ hours.

Viewing Table II it is noted that if the lime-chlorine bleaches are not considered the two stage bleaches are superior in strength with the exception of the two stage lime-HOCl. Bleaching by means of hypochlorous acid in the presence of lime is not so harmful in the single stage for it ranks above hypochlorite bleaching in strength. The single stage lime-hypochlorite bleach is inferior to the single stage hypochlorite bleach and requires 15 hours instead of two.

TABLE IV.—ALPHA CELLULOSE CONTENT

No.	Process	Per Cent Cl₂	Color	Per Cent Alpha Cellulose
0	Unbleached Kraft	0	0	86.4
1	1—Stage, Hypochlorite	8	8½	85.3
2	1—Stage, Lime-Hypochlorite	8	8½	83.5
3	1—Stage, Lime-Chlorine	8	7	85.2
4	1—Stage, Lime-Chlorine	11	11½	84.3
5	1—Stage, Lime-HOCl	8	8½	83.7
6	2—Stage, Hypochlorite	5 + 3	9½	83.2
7	2—Stage, Hypochlorite	3 + 5	8½	83.1
8	2—Stage, Lime-Hypochlorite	5 + 3	10½	83.4
9	2—Stage, Lime-HOCl	5 + 3	9½	82.1

TABLE V.—LIME CONSUMPTION AND BLEACH COLOR TEST SHEETS

1. HYPOCHLORITE BLEACH TESTS

Per Cent Chlorine	Cl₂ g.	Bleach ml.	Add ml. Water	Time	Color
1	.046	3.7	68	3 mins.	1
2	.092	7.4	65	4 mins.	1½
3	.138	11.1	61	8 mins.	1½
4	.184	14.8	57	10 mins.	2½
5	.23	18.5	54	15 mins.	4½
6	.276	22.2	50	26 mins.	6½
7	.322	26.9	45	50 mins.	8–8½
8	.368	29.5	43	56 mins.	8½–9
9	.414	33.2	39	1½ hrs.	9½
10	.46	36.9	35	2 hrs.	10
11	.506	40.6	31	2½ hrs.	10½–11
12	.552	44.5	28	3¾ hrs.	11½

2. LIME-HYPOCHLORITE BLEACH TESTS

Cl₂ g.	Cl₂ Sol. ml.	Ca(OH)₂ g.	Hrs. Time	HCl ml.	Excess Lime g.	Used Lime g.	Sheet Wt. g.	Used % Lime	Used % Chlorine	Color
.046	4.11	.183	15 mins.	13	.157	.076	4.5	.577	1.02	1–1½
.092	8.22	.244	30 mins.	18	.217	.027	4.55	.593	2.02	2–2½
.184	16.44	.366	1 hr.	28	.338	.028	4.45	.63	4.14	3½
.276	26.6	.208	7¼ hrs.	12½	.151	.057	4.35	1.31	6.35	6½
.368	35.5	.281	14 hrs.	16½	.199	.082	4.37	1.88	8.42	8½
.46	44.4	.342	23 hrs.	16½	.199	.143	4.45	3.21	10.33	10½
.552	53.3	.415	36 hrs.	18	1.69	.246	4.55	5.4	12.13	12

Std. HCl .3226 N Bleach Temperature 23-27 deg. C.

3. LIME-CHLORINE BLEACH TESTS

% Chlorine	Cl₂ g.	Cl₂ ml.	Ca(OH)₂ g.	Add ml. Water	Time	St. of HCl ml.	Excess g. Lime	Used g. Lime	Sheet Wt.	Used % Lime	Used % Chlorine	Color
1	.046	15.3	.20	140	05	11	.133	.067	4.53	1.48	1.02	1½
2	.098	22	.367	136	10	18½	.223	.144	4.95	2.91	1.98	2–2½
3												
4	.196	43	.489	115	¼	17½	.211	.278	4.95	5.62	3.96	4
5												
6	.294	65	.612	93	2¼	15½	.187	.425	4.75	8.95	6.18	5½
7												
8	.392	86	.733	72	5	14½	.175	.558	4.92	11.34	7.96	7½
9												
10	.49	108	.855	50	10	15	.181	.674	4.82	13.98	10.17	9½
11												
12	.60	132	.88	28	15	1½	.018	.862	4.95	17.41	12.12	11½
1												

4. LIME-HOCL BLEACH TESTS

Cl₂ g.	HOCl ml.	Water ml.	Ca(OH)₂ g.	Time	Std. HCl ml.	Excess Lime g.	Used Lime g.	Sheet Wt.	% Used Lime	% Used Cl₂	Color
.051	5	145	.306	15 mins.	21	.253	.053	5.02	1.06	1.0	1
.1	9	141	.367	45 mins.	22	.265	.102	5.05	2.02	1.98	2
.15	13	137	.428	1½ hrs.	25	.301	.127	4.95	2.56	3.03	3
.2	18	132	.489	1¾ hrs.	27½	.332	.157	4.95	3.19	4.04	4
.25	22	128	.55	3½ hrs.	28	.338	.212	4.83	4.4	5.17	5
.29	27	123	.612	3½ hrs.	29½	.356	.256	4.95	5.17	5.86	6
.34	31	119	.672	6 hrs.	31	.374	.298	4.96	6.01	6.85	7
.39	36	114	.733	7¼ hrs.	28½	.343	.390	4.82	8.09	8.08	8
.45	43	117	.794	8 hrs.	28	.35	.444	5.0	8.88	9.0	9
.50	48	102	.855	11 hrs.	28	.35	.505	4.83	10.45	10.35	10
.55	53	97	.916		28	.35	.566	4.95	11.43	11.11	11
.60	57	93	.978		28	.35	.628	4.92	12.77	12.2	12
.091	11.5	1.40	.367	15 hrs.	23	.277	.090	4.9	1.84	1.87	1

The lime-chlorine bleaching is exceptionally good and ranks with two stage bleaching. Bleaching by means of chlorine in the presence of lime yields both a high color and high strength. It ranks highest of all bleach processes. See Table III. The time of bleaching is 20 hours.

Alpha Cellulose Content

The alpha cellulose was obtained by a standard method [6] of analysis and corrected for lignin and ash content. Table IV shows the relative order and indicates that single stage bleaching yields a higher alpha cellulose content than two stage bleaching. This must be due to the action of the spent chemicals saturating and protecting the bleach fiber tissues. The alpha cellulose content has no particular bearing on strength of pulp since the two stage bleaches are lower in alpha content. The single stage hypochlorite bleach is highest in alpha cellulose next to the unbleached stock. Rapidity of bleaching may also have some bearing on that. The single stage lime-hypochlorous acid bleach is lowest of the single stages and also the lowest of the two stages, which is in harmony with the general opinion that hypochlorous acid is active against alpha cellulose and moreover reduces pulp strength, though in the presence of lime these effects are somewhat alleviated.

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Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

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Pulp and Paper Testing

Flobility and Springback of Pulp and Board. Roger B. Brown. Paper Trade J. 94, No. 13: 35-38 (March 31, 1932).—Flobility is defined as the flow characteristic of pulp, and springback or resiliency as the amount which a moist pressed pulp expands (or "springs back") on releasing the pressure. Methods are described for determining these two properties, and the significance of the tests is discussed.—A. P.-C.

The Fastness of Colored Material to Light. P. W. Cunliffe. World's Paper Trade Rev. 97: 843-847 (March 11, 1932).—A discussion of the eight principal factors affecting the fading of dyes by light: quality and intensity of light, relative humidity of the atmosphere, temperature, depth of color, acidity or alkalinity of the support, atmospheric impurities, nature of the support, and continuous or intermittent exposure.—A. P.-C.

The Relation of Sheet Properties and Fiber Properties in Paper. III. The Effect of Fiber Length on Sheet Properties: Preliminary Experiments. R. H. Doughty. Paper Trade J. 94, No. 9: 29-34 (March 3, 1932).—Various sheets having the same solid fraction vary slightly in tensile strength; the latter increases rapidly with increase in solid fraction. Two new criteria of greaseproofness are suggested.—A. P.-C.

Use of the Naumann-Schopper Flexometer in Board Making. J. Rivière-Raverlat. Papier 35: 177-198 (Feb. 1932).—From a detailed analysis of the mechanism of the action of the Naumann-Schopper flexometer and of the information which it gives, illustrated by means of an example of the results obtained with a given sample and of the curves which can be calculated and plotted from them, the author concludes that the instrument permits of distinguishing between the two faces of a sample of board and of revealing the internal defects which may exist in the sheet. The operation of obtaining the results and information, however, is long and tedious, and they should be coordinated with a view to subsequent comparisons.—A. P.-C.

Method and Apparatus for Determining the Tearing Resistance of Paper. Friedrich Schubert. U. S. pat. 1,836,621 (Dec. 15, 1932).—The principle of the invention consists in cutting a hole in the material to be tested, held under tension in all directions, in the main testing direction at both sides of and close to the sides of a pressure tool, and subsequently allowing the tool to operate on the severed piece secured against sliding. The test is carried out with a pressure tool of rectangular cross section, which is provided with cutting edges extending beyond the end of the tool and corresponding in width to the size of the pressure tool. The test piece is placed in a special clamp which is mounted in place of the bottom clamp of a tensile-strength tester, and the pressure tool is suspended from the chain of the upper clamp.—A. P.-C.

Paper Specialties

Process and Apparatus for the Production of Double-Thickness Paper. Enrique Casanovas. Fr. pat. 700,541.—One ply is formed on a fourdrinier wire equipped with the usual table rolls and suction boxes, and also with a set of secondary suction boxes near the couch roll. The other ply is formed on a cylinder mold from which it is picked up by a felt and, without passing through any press, is applied to the first ply just before the latter reaches the secondary suction boxes. The combined sheet is pressed and dried in the usual manner.—A. P.-C.

Manufacture of Paper Twine. Alex Hayner assignor to United Shoe Machinery Corp. U. S. pat. 1,837,433 (Dec. 22, 1931).—Sizing is applied to a strip of strong paper; the sized strip is passed through a die and twisted to form paper twine; the moist twine is then given a

supplemental twist of a much smaller number of turns to the foot than the original twist.—A. P.-C.

Former for Combination Fiber Paper Twine. Henry S. Mears assignor to International Harvester Co. U. S. pat. 1,832,942 (Nov. 24, 1932).—The former comprises upper and lower sections, cooperating paper and fiber guiding and distributing surfaces on adjoining faces of the sections, and abutments at opposite sides of the surfaces for causing the edges of the paper to be tucked under the fiber, the abutments increasing the tucking action of the surfaces and preventing the paper from running out sideways of the sections.—A. P.-C.

Process of Making Paper and Paperboard. Levis M. Booth. Can. pat. 316,018 (Oct. 13, 1931).—Paper and paperboard are manufactured by adding lime, bleaching powder and a separate coagulating material to the stock and retaining the mineral residue in the product.—A. P.-C.

Sheets of Felted Cellulosic Fibers United by Lignin. William H. Mason assignor to Masonite Corp. U. S. pat. 1,844,861 (Feb. 9, 1932).—A number of wet felted sheets of cellulose fiber such as that from saw-mill waste containing a substantial proportion of lignin are placed in a heated platen-press which closes successively on different sheets at such speed that the first sheet closed upon does not become heated above 100° C. until after the press is fully closed.—A. P.-C.

Pressing Fiber Board. William H. Mason assignor to Masonite Corp. U. S. pat. 1,844,921 (Feb. 9, 1932).—Sheets of fiber board are pressed in a hot press having a pressing surface of "frosted" metal, such as "frosted" chromium, the frosting being sufficiently fine to produce a surface smooth to the touch and slight, and sufficiently course to minimize the formation of pockets in the surface of the material pressed.—A. P.-C.

Fiber Board. James Carnie assignor to The Mechanical Rubber Co. U. S. pat. 1,843,943 (Feb. 9, 1932).—In making a waterproof fiber board, pulp is beaten with a non-rubber dispersion containing an organic acid-coagulable material such as rosin, together with finely divided sulphur, an acid-reacting material such as alum is added, uniform deposition of sulphur on the fibers is effected, and the treated fibers are formed into sheets, which may also contain rubber, synthetic resins, etc.—A. P.-C.

Laminated Wall Board. Philip W. Codwise assignor to Certain-teed Products Corp. U. S. pat. 1,843,915 (Feb. 9, 1932).—Layers of material are united by a stiffening adhesive such as clay and silicate or lime-casein glue mixture, and each of the layers is formed with outer plies composed of coarse ground wood screenings of relatively long fiber length and inner plies composed in part at least of waste papers.—A. P.-C.

Greaseproof and Waterproof Pulp Receptacles. M. Gentile and S. W. Weis, Brit. pat. 349,724 (April 14, 1930).—Cartons, pails or other receptacles are coated internally successively with animal or vegetable gelatin and with thin layers of cellulose ester such as cellulose nitrate or acetate containing castor oil in large proportion.—A. P.-C.

Transparent Viscose Films: Their Manufacture and Uses. M. Halama. World's Paper Trade Rev. 97: 828-836, 894, 896 (March 11, 1932).—A description of the methods of manufacture and uses of cellophane.—A. P.-C.

Machine and Process for Making Corrugated Board. George W. Swift, Jr., assignor to George W. Swift, Jr., Inc. U. S. pat. 1,848,583 (March 8, 1932).—Corrugating rolls cooperate with each other in the common plane of their rotary axes. Pressure rolls contact with one of the corrugating rolls in angularly displaced planes which include the axis of the corrugating roll.—A. P.-C.

Composite Insulating Board. George R. Wyman assignor to Bird and Son, Inc. U. S. pat. 1,855,161 (April 19, 1932).—The board has a core consisting of one or more corrugated plies, with a facing sheet between adjacent plies. On each side of the corrugated core is a facing sheet, at least one of which consists of a coarse porous sheet, such as ground wood screenings, so as to enable the forming of a good bond when plaster is applied to it.—A. P.-C.

Roofing Tile and Method of Making Same. Ernest P. Everett. U. S. pat. 1,844,647 (Feb. 9, 1932).—A coating of adhesive is applied to a sheet of material such as roofing felt, or the like, which is rolled around a frustroconical shaped mandrel against which act one or more press rolls. The resulting hollow blank is removed from the mandrel and cut along longitudinal elements to form a number of trough-like roofing tiles.—A. P.-C.

Composition Strips for Building Construction. Albert C. Fischer assignor to The Philip Carey Manufacturing Co. U. S. pat. 1,844,467 (Feb. 9, 1932).—A rubber-bearing shrub such as guayule is shredded and a waterproof binder such as blown asphalt is incorporated in the shredded material in successive stages while the binder is in liquid condition, so that the binder is reduced to a flowable mastic condition by the mixing and the material is then pressed into a desired form such as roofing, flooring or paving blacks.—A. P.-C.

Strip Shingle and Method of Making the Same. Bernard C. Beckman assignor to The Patent and Licensing Corp. U. S. pat. 1,851,300 (March 29, 1932).—Thick-butt strip shingles are made by applying to one face of a saturated felt sheet a coating of waterproofing material in a plastic condition, shaping the coating in ridges and valleys extending longitudinally of the sheet, permitting the shaped coating to harden, slitting the sheet along the lines of maximum and minimum thickness, and severing the slitted sheets into shingle strips.—A. P.-C.

Ornamental Coatings on Paper, Etc. Azariah Y. Pearl assignor to Laboratoires Sevigne-Pearl, Inc. U. S. pat. 1,844,479 (Feb. 9, 1932).—A solution containing salicylic acid and nitrocellulose is applied to paper and the solvent is allowed to evaporate to cause a setting of the nitrocellulose and crystallization of the salicylic acid; and the product is then treated with an aqueous solution of borax.—A. P.-C.

Mulch Paper. Charles J. Allen assignor to S. L. Allen and Co., Inc. U. S. pat. 1,844,051 (Feb. 9, 1932).—An elongated strip of mulch paper is folded transversely of itself at longitudinally spaced intervals to form spaced groups of overlapping sections. Water-soluble glue is applied between at least two of the adjacent overlapping sections in each group, so as to permit the sections to separate upon the application of longitudinal tension to the strip when subjected to a predetermined amount of moisture.—A. P.-C.

Corrugated Kraft Paper. Georges Charriaud. Fr. pat. 39,241, addition to 700,236.—Kraft paper is passed between corrugating rolls while supported on a belt carrying grooves corresponding to the corrugations. The carrying belt is heated by passing over one or more heated rolls in order to dry the corrugated paper. Two or more sheets may be first joined adhesively before corrugating.—A. P.-C.

Paper Reenforcing Machine. George E. Gibbs assignor to American Reenforced Paper Co. U. S. pat. 1,850,301 (March 22, 1932).—Sheet-like sections of unspun fibers are deposited successively transversely on a paper web covered with an adhesive. It is passed around a heated roll to iron out the unspun fibers and is then fed to a press together with a second paper web, an attenuated

web of unspun fibers being delivered between the two sheets of paper at the nip of the press to reenforce the paper longitudinally.—A. P.-C.

Properties of Fiber Building Boards. C. G. Weber, F. T. Carson and L. W. Snyder. U. S. Bur. Stand. Misc. Publ. No. 132. 14 p. 1931.—The average density of laminated wallboards is twice that of homogeneous insulating boards (which are usually made thicker), and the flexural breaking strength is about the same for both classes. No marked differences in thermal conductivity was observed; a rough proportionality existed between density and expansion in saturated water vapor.—A. P.-C.

Effect of Atmospheric Humidity on the Tensile Strength of Writing and Printing Papers. Albert Arendt and Emmanuel Wathelot. Mon. Papeterie Belge 12: 105-113 (Feb., 1932).—A general discussion of the effect of hydrometric conditions on the breaking length of writing and printing papers.—A. P.-C.

Process for Forming Thick-Butt Shingles. Clarence R. Eckert assignor to The Barrett Co. U. S. pat. 1,842,448 (Jan. 26, 1932).—A web of roofing felt is saturated with asphalt, coated on one surface with waterproofing material and surfaced with granular material over the entire coated face. The web is cut into strips having tabs along one longitudinal edge. The granular-surfaced face and cut edges of the strips are coated with waterproofing material applied in stripes, each coating stripe being of such a width that it substantially completely covers the face of the tabs. Granular material is applied to the stripes and the strips are cut into thick-butt shingle elements having tabs along one edge. The whole process is continuous.—A. P.-C.

Manufacture of Stencil Sheets. S. Horii. Brit. pat. 365,542 (Oct. 17, 1930).—A fibrous base such as Yoshino paper is coated with a solution of esters of polysaccharides (cellulose, starch), tempering agents (resins, oils, fatty acids and their esters, triphenyl phosphate, etc.) and stabilizing coloring substances (opaque red, orange, yellow or brown dyes or pigments) which absorb the ultra-violet rays of sunlight.—A. P.-C.

Paper Stencil Sheets. Paul A. Gollnick assignor to Selectograph Co. U. S. pat. 1,846,003 (Feb. 16, 1932).—A liquid such as a suitable stencil-sheet composition is applied to one side only of a sheet of Japanese Yoshino paper, and the other side is then wiped for breaking the surface tension of the liquid and thereby causing the liquid to penetrate the sheet for coating the opposite side.—A. P.-C.

Roofing Material. Harry C. Fisher, Alan M. Overton and Charles L. Keller assignors to The Richardson Co. U. S. pat. 1,844,951 (Feb. 16, 1932).—A pulp is formed containing feltable fibers, associated with a relatively soft bituminous material in minute, uncoated particles in stable association with the fibers, and this pulp is mixed with a desired proportion of another generally similar pulp, which, however, contains a harder bituminous material, and the mixed pulp is felted, dried and heated.—A. P.-C.

Apparatus for Making Prepared Roofing. Henry C. Koch. U. S. pat. 1,847,767 (March 1, 1932).—The apparatus comprises a combination of means for slitting a web of roofing material into narrower strips, cutting the smaller strips longitudinally along vari-directional lines in accordance with a predetermined design and forming other strips having complementary projections and recesses, and for cutting each of the last-mentioned strips and transversely, into shingles of predetermined size.—A. P.-C.

Method of Saturating Sheets. Edward A. Leonard. U. S. pat. 1,845,299 (Feb. 16, 1932).—Absorbent sheets are saturated by passing downwardly into and upwardly out of a body of saturant and showering the surface of the saturant between the entry and exit of the sheet.—A. P.-C.

Protective Coating for Paper and Articles Made of Paper. H. J. Prins. Brit. pat. 365,466 (May 27, 1931).—After pretreatment with casein, gum, glue, etc., in order to fill the pores, paper is coated with a latex or emulsion of rubber, gutta-percha, balata, etc., partly dried, further treated with mineral or vegetable waxes, and heated at or above the melting point of the wax.—A. P.-C.

Paper Deckling Device. Prestel O. Dodge. U. S. pat. 1,846,094 (Feb. 23, 1932).—An arm pivoted to a guide member and carrying a small wheel travels in a slot in a deckle board. The sheet is placed over the slot so that the blunt edge of the wheel depresses the sheet into the slot until it breaks under the tension.—A. P.-C.

Process for the Manufacture of Corrugated Paper or Board. O. Goy. Belg. pat. 381,147 (Aug. 31, 1931).—Before corrugating the paper, a hardening material is incorporated with it to maintain the form of the corrugation. A. P.-C.

Silicated Fiber Board. Oliver B. Andrews. U. S. pat. 1,841,775 (Jan. 19, 1932).—A strong waterproof fiber board is made from a comparatively weak fiber board composed of a number of laminations rigidly secured together by applying to the surface of the board a 40° Baumé sodium silicate solution at 70° F. The solution is caused to penetrate a slight distance into the outer plies and form a coating on the surface. The boards are dried at 70° F. stacking them vertically, with the grain running in a vertical direction so that the tendency to warp is reduced to a minimum.—A. P.-C.

Mulch Paper. A. Coucherij. Belg. pat. 376,759 (Feb. 28, 1931).—The paper is treated so as not to become defibered in water and retain its absorption characteristics; it is impregnated with a fertilizing product and is dried. —A. P.-C.

Method of Producing Waxed Printed Paper. Edward C. Francoise assignor to Kalamazoo Vegetable Parchment Co. U. S. pat. 1,845,260 (Feb. 16, 1932).—One side of the stock is printed, a film of liquid wax is applied to the other side, the web is wound, and, after the ink is dry, the web is unwound and passed through a bath of hot liquid wax.—A. P.-C.

Method of and Means for Coupling Fiber Conduits. Howard Parker assignor to Brown Co. U. S. pat. 1,853,-698 (April 12, 1932).—The end of the conduit is provided with a fiber collar of substantial length which is fastened to the conduit by means of pegs of fibrous material embedded in the collar and in the end of the conduit.—A. P.-C.

Producing Molded Pulp Articles. Merle P. Chaplin assignor to Fidelity Trust Co. U. S. pat. 1,848,055 (March 1, 1932).—A series of forming dies are mounted on a rotating drum, the inside of the dies being connected to a source of vacuum over a portion of their travel. Pulp is discharged from jets on to the dies as the latter move past the jets. The dies carrying the pulp travel through an enclosed space where the pulp is partially dried, and the articles are then delivered on to a conveyor which carries them through a drier where drying is completed.—A. P.-C.

Adhesive Strip. Eduart Schnitzler assignor to I. G. Farbenindustrie A.G. U. S. pat. 1,837,680 (Dec. 22, 1931). —Paper is coated on one side with a sticky adhesive such as a rubber composition and on the other side is coated with a cellulose derivative containing a radical of a higher fatty acid such as cellulose laurate (to facilitate unwinding when in rolls).—A. P.-C

Carbon Paper. Charles J. Dienelt. U. S. pat. 1,836,-907 (Dec. 15, 1931).—Reinforcing crips are formed along the marginal edges of the sheet to render it non-curlable. —A. P.-C.

Process for Impregnating or Incrusting Hydrolized Fibrous Materials Such as Imitation Parchment Paper. August Regal. U. S. pat. 1,843,783 (Feb. 2, 1932).—A fibrous material, such as paper, is hydrolyzed by a liquid such as sulphuric acid which is effective to produce separation of artificial resin from an alkaline solution of the artificial resin, and the material is then mixed with such a solution to effect separation of the artificial resin and impregnation of the material with it.—A. P.-C.

Embossing Wallboard. Charles A. Upson assignor to The Upson Co. U. S. pat. 1,833,060 (Nov. 24, 1931).—Embossed wallboard comprising a flexible liner and a body of inorganic filler is prepared by first embossing the liner on one surface only under pressure, the other surface remaining smooth, and then applying the filler to the smooth side of the filler in a plastic state. The structure is then immediately subjected to a relatively high degree of heat to drive the moisture from the filler before the liner is impregnated, while at the same time supporting the liner side of the structure continuously against a smooth flat surface.—A. P.-C.

Fireproof Wallboard, Paper, Etc. Fernando S. Vivas assignor to International Fireproof Products Corp. U. S. pats. 1,839,135 and 1,839,136 (Dec. 29, 1931).—*No. 1,839,135*—Pulp is beaten with an aqueous solution having a density of about 18° Baumé and formed from a mixture of magnesium sulphate 24, borax 8, ammonium sulphate 8 and dextrin 1.6 parts. *No. 1,839,136* relates to a similar process in which the solution used is formed from a mixture of magnesium chloride 24, boric acid 4, ammonium chloride 4 and alco-glycero-dextrin solution 1.6 parts.—A. P.-C.

Method and Apparatus for Manufacturing Roofing. Frederick C. Overbury assignor to The Patent and Licensing Corp. U. S. pat. 1,841,296 (Jan. 12, 1932).—Slots are formed in a sheet of roofing material to constitute the tab separating spaces of the finished strips; the sheet is weakened along lines in predetermined relation to the slots; it is then coated with waterproofing material, mineral surfacing is applied to the coated areas, and the sheet is separated into strips along the weakened lines by exerting a pull on the sheet.—A. P.-C.

Composite Building Paper. George E. Gibbs assignor to American Reenforced Paper Co. U. S. pat. 1,841,946 (Jan. 19, 1932).—A multi ply building paper comprises two flat sheets of paper of slightly different lengths adhesively secured together. The outer and longer sheet, that is exposed to the weather, is provided at spaced intervals with small folds forming plaits that decrease the length of the sheet slightly and that are adapted to straighten out as this sheet shrinks relatively to the other sheet, to thereby prevent the overall dimension of the composite paper from decreasing under the shrinking action of the outer sheet.—A. P.-C.

Method of and Machine for Manufacturing Roofing Material. Mathew R. Becker assignor to Becker Roofing Co. U. S. pat. 1,834,998 (Dec. 8, 1931).—Roofing felt is coated with molten asphalt; colored crushed stone is applied in spaced panels arranged in two series longitudinal of the strip; the strip is severed longitudinally along the uncoated portion between the two series, and soap is applied to the freshly cut edges to prevent them from recementing together.—A. P.-C.

Method of and Apparatus for Making Strip Shingles. Lester Kirschbraun assignor to The Patent and Licensing Corp. U. S. pat. 1,834,954 (Dec. 8, 1931).—A series of separate unconnected tab-forming cuts are made through a sheet of bitumen-saturated roofing felt to form longitudinal strips united between successive cuts by the uncut bonds of the sheet. A coating of waterproofing material is applied to the face and cuts of the sheet; the coating is surfaced with granular material, the bonds connecting the strips are removed, and individual elements are cut from the strips.—A. P.-C.

Safety Paper. Joseph A. Lowe. U. S. pat. 1,818,726 (Aug. 11, 1931).—In a multi-ply paper, the inner ply is impregnated with a colored adhesive which connects it to the outer plies. The color provides a hidden identification stratum.—A. P.-C.

Tissue Pad. Kurt Wandel assignor to National Cellulose Corp. U. S. pat. 1,820,259 (Aug. 25, 1931).—A pad of facial tissue comprises a number of sheets having their edges held together along one edge solely by the interlocking fibers of the sheets.—A. P.-C.

Method of Reinforcing Porous Paper. Edgar F. Woodward assignor to Lewis C. Van Riper. U. S. pat. 1,831,403 (Nov. 10, 1931).—Reinforced porous paper is produced by feeding from rolls sheets of porous paper and net-like fabric, respectively, applying an adhesive to the fabric and removing excess adhesive, thereby leaving the meshes of the fabric free from adhesive, pressing the fabric into face contact with the paper, and drying the unitary sheet.—A. P.-C.

Paper or Pasteboard. Antonio Ferretti. Fr. pat. 713,871 (March 26, 1931).—Paper or pasteboard containing rubber, etc., is made by mordanting the vegetable fibers of the paper with a coagulating agent for the latex such as aluminum sulphate before the latex is introduced and mixed with the pulp. Or the latex is coagulated on the fibers by means of ammonium chloride, magnesium chloride, magnesium sulphate, or the equivalent.—A. P.-C.

Safety Paper. Arthur E. Remick assignor to The Todd Co. U. S. pat. 1,839,995 (Jan. 5, 1932).—A guanidine substance such as diphenylguanidine acetate or a similar salt is used in preparing safety paper for bank checks, etc.—A. P.-C.

Cigaret Paper. Basile Seferiadis assignor to S. C. Patents, Ltd. U. S. pat. 1,839,346 (Jan. 5, 1932).—There is incorporated in this cigaret paper, during manufacture, a natural gum such as gum mastic containing soothing and sweetening substances. Gum arabic or adraganthin also may be used.—A. P.-C.

Waterproof Sheets. George H. Ellis assignor to The Insulite Co. U. S. pat. 1,839,660 (Jan. 5, 1932).—A soft, porous, air-filled sheet is formed from pulped cellulosic material, dried by heating, and treated with sulphur under pressure at a temperature sufficiently high to maintain the sulphur in molten condition.—A. P.-C.

Greaseproof and Waterproof Paper. Manilo Gentile assignor of one-half to Samuel W. Weis and one-fourth to George Pick and one-twentieth to Nathan Schwartz. U. S. pat. 1,832,978 (Nov. 24, 1931).—A grease- and moisture-proof flexible material adapted to be used for wrapping sheets, cartons, etc., is made from a paper base coated with a film consisting essentially of transparent nitrocellulose containing a modifying agent from the group consisting of castor oil and tricresyl phosphate, that renders the film soft and pliable when dry and which causes the film to adhere evenly by penetration of the fibrous structure of the base.—A. P.-C.

Paper. Joseph A. Lowe assignor to Falulah Paper Co. U. S. pat. 1,826,557 (Oct. 6, 1931).—The sheet comprises three attached sheets. The intermediate sheet is of long-fibered kraft paper. The outer sheets are of short fiber. An adhesive secures the sheets together, forming a single sheet capable of scoring and bending without breaking the intermediate sheet, constituting in effect a hinge for the scored outer sheets.—A. P.-C.

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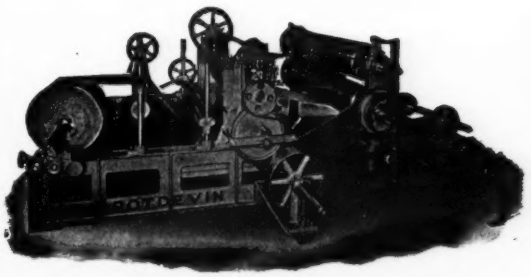

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Hemsith Basse & Co., Bremen, Bremen, 1 cs.; Schencker & Co., Waukegan, Havre, 6 cs.

WRITING PAPER

Hudson Fd'g & Shipping Co., Berengaria, Southampton, 1 cs.

CARD BOARD

Coty Processing Co., Rochambeau, Havre, 14 cs.

STRAW PAPER

American Express Co., France, Maru, Hamburg, 45 bls.

MISCELLANEOUS PAPER

American Shipping Co., Dresden, Bremen, 2 cs.; H. Reeve Angel & Co. Inc., Kungsholm, Gothenburg, 6 bls.; The Borregaard Co., Inc., Kungsholm, Gothenburg, 232 rolls; Kraemer & Co., Kungsholm, Gothenburg, 46 bls.; Japan Paper Co., Kungsholm, Gothenburg, 3 cs.; Standard Products Corp., Rochambeau, Havre, 2 cs.; Corn Exchange Bank, Tatsuno Maru, Osaka, 13 cs.

RAGS, BAGGINGS, ETC.

Bank of N. Y. & 8rust Co., Dresden, Bremen, 42 bls. old linens; Darmstadt Scott & Courtney, Dresden, Bremen, 58 bls. thread waste; Bank of Manhattan Co., American Banker, London, 28 bls. paper stock; E. J. Keller Co., Inc., Coahoma County, ———, 39 bls. rags; E. J. Keller Co. Inc., Scanmail, ———, 325 bls. flax waste, 185 bls. new cuttings; E. J. Keller Co., Inc., Black Hawk, ———, 422 bls. flax waste, 66 bls. new cuttings, 48 bls. bagging; G. W. Millar & Co., Black Hawk, Antwerp, 193 bls. flax waste.

OLD ROPE

Chemical Bank & Trust Co., Sinaia, Marseilles, 89 rolls; N. E. Berzen, Exeter, Marseilles, 44 rolls.

Why not get the best that can be had?

H. & M.

COLORS FOR PAPER

have proved they are the best and are being used daily by the greatest number of paper mills.

Service and Quality will tell

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Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

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High Grade Coated Book

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KRAFT WRAPPING AND KRAFT ENVELOPE

Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

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All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

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CANTON. MASS.

Woolen manufacturers since 1856

WOOD PULP

A. Giese & Son, Statendam, Rotterdam, 50 bls. wood pulp; E. M. Sergeant & Co., Fred. VIII, Oslo, 150 bls. chemical pulp, 25 tons; Atterbury Bros. Inc., Fred. VIII, Oslo, 175 bls. sulphite, 32 tons; Castle & Overton, Inc., Coahoma County, Rotterdam, 560 bls. wood pulp, 112 tons; Castle & Overton, Inc., Scanmail, Wiborg, 528 bls. wood pulp, 104 tons; Johaneson Wales & Sparre, Inc., Kungsholm, Gothenburg, 5 bls. sulphite; ———, Pr. Roosevelt, Hamburg, 340 bls. wood pulp.

PULP WOOD

West Virginia Pulp & Paper Co., Pluto Soldiers Cove, N. S., 1030 cords; Bank of America, (Albany), Dagfred, Archangel, 3374 cords.

WOOD PULP BOARDS

Lagerloef Trading Co., Scanmail, Kotka, 48 bls., 6 tons.

WOOD FLOUR

State Chemical Co., Statendam, Rotterdam, 700 bags; The Burnet Co., Statendam, Rotterdam, 1000 bags.

PORTLAND IMPORTS

WEEK ENDING AUGUST 13, 1932

Gottesman & Co., Inc., Sparreholm, Sweden, 3000 bls. wood pulp; Gottesman & Co. Inc., Bockenheim, Sweden, 10,000 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING AUGUST 13, 1932

Lafayette Worsted Co., New Britain, Antwerp, 47 cs. parchment paper; Gottesman & Co. Inc., Toledo, Sweden, 1000 bls. wod pulp.

CAMDEN IMPORTS

WEEK ENDING AUGUST 13, 1932

———, Scanmail, Wiborg, 3000 bls. sulphate, 501 tons; ———, Scanmail, Kotka, 3000 bls. sulphate, 501 tons.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 13, 1932

E. J. Keller Co. Inc., Indep. Hall, ———, 159 bls. rags; Castle & Overton, Inc., Indep. Hall, Bordeaux, 61 bls. rags; ———, Scanmail, Kotka, 164 rolls news print; ———, Scanmail, Kotka, 853 bls. sulphite, 154 tons; Lagerloef Trading Co., Scanmail, Kotka, 350 bls. sulphite, 57 tons, 2204 bls. mechanical pulp, 440 tons, 200 bls. wood pulp boards, 31 tons, 762 rolls wood pulp boards, 84 tons; Castle & Overton, Inc., Scanmail, Wiborg, 536 bls. wood pulp, 107 tons; ———, Scanmail, Wiborg, 263 bls. sulphate, 52 tons; ———, Scanmail, Wiborg, 5914 bls. sulphite, 1058 tons; Irving Trust Co., Scanmail, Wiborg, 175 bls. wood pulp, 29 tons.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 13, 1932

Congoleum Nairn Co., Indep. Hall, Bordeaux, 1011 bls. rags; Congoleum Nairn Co., Indep. Hall, St. Nazaire, 236 bls. rags; Gottesman & Co. Inc., Ala, Germany, 1050 bls. wood pulp; Gottesman & Co. Inc., Toledo, Sweden, 1000 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING AUGUST 13, 1932

De Manduit Paper Corp., Indep. Hall, St. Nazaire, 200 cs. cigarette paper.

MONTREAL IMPORTS

WEEK ENDING AUGUST 13, 1932

Gottesman & Co. Inc., Idefjord, Sweden, 8300 bls. wood pulp.

Judge Badger Hears Paper Power Case

[FROM OUR REGULAR CORRESPONDENT]

PLATTSBURG, N. Y., August 15, 1932—A hearing is now being held at the court house here before Judge Badger in the action brought by the Saranac River Power Company against the receivers of the defunct Saranac Pulp and Paper Company to recover alleged damages of $1,500,000. The action came about through the refusal of the receivers to buy power under a contract which the Saranac River Power Corporation made to sell power to the Saranac Pulp and Paper Company for a period of twenty years at a minimum of $100,000 yearly. The power company contends that the contract is effective for fifteen more years.

The mills of the Saranac Pulp and Paper Company were taken over by the Berst, Forester & Dixfield Company at a bankruptcy sale several months ago. It is understood that $425,000 was the purchase price and this amount was to have been divided among the creditors of the concern. However, it is believed now that the creditors will not benefit by the sale if the claim of the power corporation is allowed. Consequently, the claim of the power corporation was rejected by the trustee in bankruptcy for the Saranac Pulp and Paper Company which resulted in the proceedings before Judge Badger.

Ticonderoga Holds Field Day

[FROM OUR REGULAR CORRESPONDENT]

TICONDEROGA, N. Y., August 15, 1932—The annual field day of the employes of the Ticonderoga Pulp & Paper Co. was held last week at the state park at Crown Point with several hundred persons in attendance. A program of sports was not carried out because of unsettled weather conditions. The event has been voted a complete success by the members of the committee who had charge of the arrangements.

F. M. Williams Gets Patent

WATERTOWN, N. Y., August 8, 1932.—Frank M. Williams. of this city, has been granted a patent on a machine described as a suction box dresser with a number of construction elements regarded as original. The invention is designed for refinishing the surface of suction boxes for paper machines. Application for the patent was made in 1929.

Increase Operations at Corinth

[FROM OUR REGULAR CORRESPONDENT]

CORINTH, N. Y., August 15, 1932—Operations were increased this week at the local branch of the International Paper Company with the starting of two paper machines. Only two of the several machines are not being operated and indications are that these will be in action in the near future. The placing of the idle machines in operation resulted in the recall of a number of workers.

James P. Riley Dead

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., August 15, 1932—James E. Riley, for many years superintendent of the Fenimore branch of the Union Bag & Paper Co., died this week at his home here following an extended illness. He was connected with the company until about four years ago when ill health forced his retirement. The survivors include a brother and a sister.

Horizontally Split Casing Double Suction Pumps

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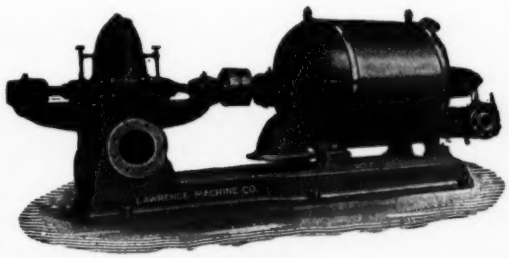
The name protects and guarantees you satisfaction.

We are the original designers and builders of the LAWRENCE PUMP.



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Thousands of installations and the successful performance of our pumps should be sufficient proof of our ability to handle your pumping problems. Our engineering force is at your command.

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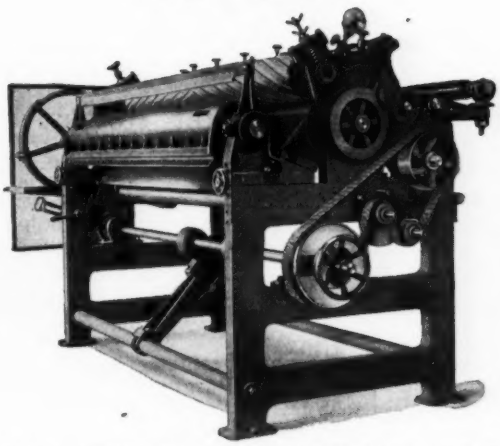
Lawrence Machine & Pump Company
361 Market St. Lawrence, Mass.

MODEL 28

ROLLER BEARING CUTTER



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LAWRENCE, MASS.

MAKERS OF
SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS, CUTTER KNIVES, PATENT TOP SLITTERS.

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for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

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SOLD BY
BULKLEY, DUNTON & COMPANY
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The Use of

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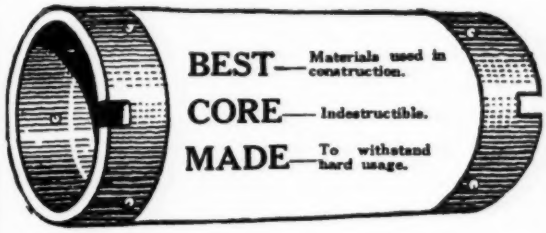

Your two sources of supply are

Canadian Elixman Company
HAMILTON, ONTARIO

Elixman Paper Core Company
CORINTH, N. Y.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, August 17, 1932.

Conditions in the local paper market are gradually improving. Although the prevailing demand is only moderately active, inquiries for future account are more numerous and the outlook is brighter. Sales forces of the leading paper organizations are planning a strenuous Autumn campaign. Prices remain unchanged, in most instances.

The news print paper market continues quiet. According to the News Print Service Bureau the Canadian mills produced 192,936 tons less in the first seven months of 1932 than in the first seven month of 1931, which was a decrease of 14 per cent. The output in the United States was 71,923 tons, or 10 per cent less than for the first seven month of 1931, in Newfoundland 7,346 tons, or 4 per cent less; and in Mexico 1,768 tons less, making a North American decrease of 273,973 tons or 12 per cent.

No radical changes were reported in the paper board market. Demand for box board is fairly persistent but the price situation remains unsatisfactory. The trend of the fine paper market is fairly steady. Tissues are going forward in good volume. The coarse paper market is irregular and kraft wrapping paper prices are easy.

Mechanical Pulp

The ground wood market is exhibiting a strong undertone. With production of foreign and domestic mechanical pulp practically keyed to consumption, the industry is in a sound statistical position. Shipments against contract are moving in seasonal volume. Prices are generally holding to formerly quoted levels.

Chemical Pulp

Demand for the various grades of imported and domestic chemical pulp is improving. There are also a number of inquiries around for future needs, some of which should materialize into satisfactory orders. Quotations are generally holding to schedule and reports of concessions on desirable business are infrequent.

Old Rope and Bagging

The old rope market is only moderately active. Little interest is being displayed at present in either domestic or foreign old manila rope. Small mixed rope continues listless. Old rope quotations remain unchanged. The bagging market is more buoyant. Gunny bagging is moving freely, while scrap and roofing are somewhat steadier.

Rags

Some improvement was noticed in the domestic rag market. Cotton cuttings are much firmer, with the appreciation in the price of the staple. The outlook for roofing bagging is better, and an increased demand is anticipated in the near future. There have been no further developments in the imported rag market. Prices are strictly nominal.

Waste Paper

The higher grades of paper stock are holding up well. Hard and soft white shavings are fairly steady. Book stock is rather quiet at present. Board mill request for the lower grades of waste paper is light. Offerings, however, are limited and prices are being maintained at recently quoted levels. Some dealers anticipate a busy fall.

Twine

Steadiness prevails in the local twine market. Although most of the business transacted during the past week was along routine lines there are signs of an improved demand in the near future and sentiment is better than for some time past. Prices of the various grades are steady despite keen competition.

More Inquiries in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., August 15, 1932—Judging from the number of inquiries being received in the fine paper market, it would seem that many of the retailers are beginning to figure on the opening of school. Thus far, orders have not been so heavy, but the inquiries lead the jobbers to believe business for fall will pick up within the next week. Most of the schools of the state open the week following Labor Day and the dealers will have to have considerable stock before this occurs. Colleges open about the middle of September. Stocks in retail hands, suitable for ordinary school purposes, were not large during the summer months.

The wrapping paper and bag industries are looking forward to a better fall season than they had last year. Already there are signs in the way of inquiries and the situation is much more hopeful. The summer business while lower than average, was not entirely unsatisfactotry. The fact that stocks have been held low by consumers has created many orders, even if for small amounts.

Summer specialties continue to rule the demand. Hot weather has been uniform for the last month, though not so extreme as a year ago, and all specialties have been going over big. The container market, particularly that serving the ice cream trade, has been very good and will continue far into the fall, given seasonable weather. Other containers seem to be well fixed as compared with the remainder of the paper industry. One reason advanced for this is the fact that continually more markets are being developed in this field.

Indiana manufacturers continue to operate on a part time basis and the tendency is to go slow until the future is more accurately determined. Warehouse stocks are not large and any demand from the jobbers would result in an almost immediate increase in production.

All paper stocks continue at the low prices that have been prevalent for the last two months. Mills are buying only their immediate requirements and these are not noticeably heavy.

LAND O'LAKES CASEIN

High quality Casein made under strict laboratory control. Excellent solubility. Satisfactory viscosity. Write for sample and quotations.

LAND O' LAKES CREAMERIES, INC., MINNEAPOLIS, MINN.
New York City - Chicago - Boston - Philadelphia - Pittsburgh - Syracuse

Sulphur

A FIRST REQUISITE

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Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

The B.C. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

100 Tons Kraft Per Day — 58% A. D.
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Production . . . .

Kraft	up to	100 Tons
Sulphite	up to	80 Tons
Soda	up to	60 Tons
Groundwood	up to	50 Tons

Results . . . . . .

With 1 Press	42% A.D.
With 2 Presses	55% A.D.
With 2 Presses & Predryer	58% A.D.

Saves . . . . . .

Felt, Wires, Labor, Upkeep, Power, Fibre, Floor Space

G. D. JENSSEN CO.

Chrysler Bldg., N. Y. C. *Sole Agents in U. S. A. for* 1017 White Bldg., SEATTLE
PAPER MACHINERY Ltd.
MONTREAL

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, August 17, 1932.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Demand for bleaching powder is only moderately active. The contract movement is mainly seasonal. Prices are holding to previously quoted levels. Bleaching powder is selling at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market is firmer. Domestic standard ground is now quoted at 5¼ cents and finely ground at 6¼ cents per pound. Argentine standard ground is selling at 8 cents and finely ground at 8½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. The contract movement is well up to average. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is fairly steady. Contract shipments are going forward in moderate volume. Imported china clay is quoted at from $10 to $15 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at mine.

CHLORINE.—Some improvement was noticed in the chlorine market. Demand from the paper mills is slightly better. Prices are steady and unchanged. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market continues to improve. The grades of gum rosin used in the mills are quoted at from $3.55 to $3.75 per 280 pounds, in barrels, at works; while wood rosin is selling at $2.50 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Most of the business transacted in the salt cake market was routine. Salt cake is quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works. Imported salt cake is selling at from $14 to $15 per ton, ship side.

SODA ASH.—Demand for soda ash is fairly persistent. Supplies are moving into consumption at a steady pace. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.25; and in barrels, $1.38.

STARCH.—Conditions in the starch market are fairly satisfactory, although demand is light at present. Prices are holding to schedule. Special paper making starch is quoted at $2.44 per 100 pounds, in bags; and at $2.71 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Trading in the sulphate of alumina market is fairly brisk. Prices remain unchanged. Commercial grades are quoted at from $1.25 to $1.40; while iron free is offered at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Production of talc is being maintained in sufficient volume to take care of current requirements. Domestic talc is still quoted at from $16 to $18 per ton, in bulk, at mine; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	38.00
Bonds	4.50	@	53.25
Index	6.00	@	12.00
Writings—			
Extra Superfine	6.50	@	15.00
Superfine	6.25	@	14.75
Tub sized	4.50	@	7.00
Engine sized	4.00	@	5.00
Book, Cased—			
S. & S. C.	5.25	@	—
M. F.	3.75	@	5.00
Coated and Enamel	6.25	@	9.75
Lithograph	6.75	@	11.25
Tissues—Per Ream—			
White No. 1	.50	@	.70
Anti-Tarnish M. G. only	.65	@	.70
Colored	.70	@	.90
White No. 2	.55	@	.60
Kraft	.65	@	.70
Manila	.55	@	.60
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middies	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09¼	@	—
No. 2	.11¼	@	—
Bleached, basis 20 lbs.	.11¼	@	—

(Delivered New York)

News, per ton—			
Roll, contract	53.00	@	—
Rolls, spot	53.00	@	—
Sheets	58.00	@	—
Side Runs	38.00	@	43.00
Kraft—			
No. 1 Domestic	4.75	@	6.00
No. 2 Domestic	2.62½	@	—
Southern	2.62½	@	—
Imported	3.50	@	4.30
Boards—per ton—			
News	22.50	@	25.00
Straw	34.50	@	45.00
Chip	22.50	@	25.00
Binders' Boards	62.00	@	70.00
Standard 85 Test Liner	26.00	@	28.00
Sgl. Mla. Ll. Chip	35.00	@	37.50

(F. o. b. Mill)

Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—			
Moist	19.00	@	21.00
Dry	21.00	@	22.00

(F. o. b. Mill)

No. 1 Domestic	18.00	@	24.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.10	@	2.90
Easy Bleaching	1.60	@	1.75
No. 1 strong unbleached	1.40	@	1.60
Mitscherlich unbleached	1.60	@	1.75
No. 2 strong unbleached	1.25	@	1.35
No. 1 Kraft	1.50	@	1.65
No. 2 Kraft	1.35	@	1.40
Sulphate—			
Bleached	1.85	@	2.15

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	2.10	@	3.75
Easy Bleaching	1.75	@	1.90
News	1.50	@	1.65
Mitscherlich	2.40	@	2.55
Kraft (Domestic)	1.50	@	2.75

(Delivered Paper Mills)

Soda Bleached	2.25	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	4.00	@	4.25
New White, No. 2	3.00	@	3.25
Silesias No. 1	3.75	@	4.00
New Unbleached	5.50	@	6.00
New Soft Blacks	2.75	@	3.00
Blue Overall	3.00	@	3.50
Fancy	1.50	@	1.75
Washables	1.15	@	1.40
Mixed Khaki Cuttings	2.50	@	3.00
Pink Corset Cuttings	2.75	@	3.25
O. D. Khaki Cuttings	3.00	@	3.25
Men's Corduroy	1.00	@	1.25
New Mixed Blacks	2.25	@	2.50

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White, No. 2—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.00	@	1.25
Black Stockings	2.00	@	2.25
Roofing Rags—			
No. 1	.53	@	.58
No. 2	.48	@	.53
No. 3	.43	@	.48
No. 4	.38	@	.43
No. 5A	.33	@	.38

Foreign Rags

New Rags

New Dark Cuttings	1.40	@	1.50
New Mixed Cuttings	1.60	@	1.75
New Light Silesias	3.40	@	3.50
Light Flannelettes	3.25	@	3.50
Unbleached Cuttings	5.50	@	6.00
New White Cuttings	4.25	@	4.50
New Light Oxfords	3.75	@	4.00
New Light Prints	2.00	@	2.25

Old Rags

No. 1 White Linens	5.25	@	5.50
No. 2 White Linens	4.50	@	4.75
No. 3 White Linens	3.25	@	3.75
No. 4 White Linens	1.75	@	2.25
No. 1 White Cotton	4.00	@	4.25
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.25	@	2.50
No. 4 White Cotton	1.40	@	1.50
Extra Light Prints	1.90	@	2.10
Ord. Light Prints	1.60	@	1.75
Med. Light Prints	1.40	@	1.55
Dutch Blue Cottons	1.35	@	1.40
French Blue Linens	1.80	@	1.90
German Blue Linens	1.70	@	1.80
German Blue Cottons	1.20	@	1.25
Checks and Blues	1.25	@	1.30
Lindsay Garments	.75	@	.80
Dark Cottons	.70	@	.75
Old Shopperies	.55	@	.60
New Shopperies	.60	@	.65
French Blues	1.25	@	1.30

Old Rope and Bagging

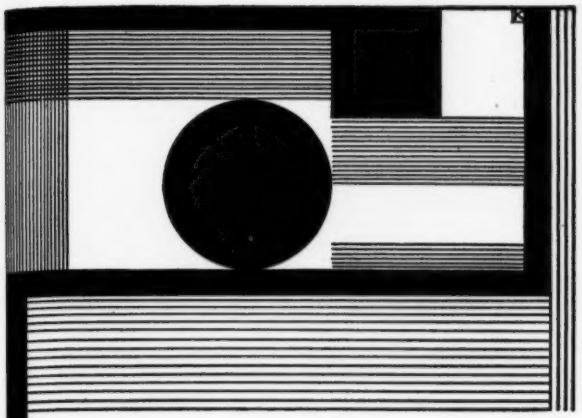
(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.00	@	1.10
Domestic	1.15	@	1.25
Wool Tares, light	.80	@	.85
Wool Tares, heavy	.80	@	.85
Bright Bagging	.75	@	.80
Small Mixed Rope	.80	@	.90
Manila Rope—			
Foreign	1.50	@	1.60
Domestic	1.50	@	1.75
New Burlap Cut	1.65	@	1.75
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	1.60	@	1.70
Ordinary Hard White No. 1	1.30	@	1.40
Hard White No. 2	1.25	@	1.30
Soft White No. 1	1.25	@	1.35
Flat Stock—			
Stitchless	.50	@	.60
Overissue Mag.	.50	@	.60
Solid Flat Book	.45	@	.50
Crumpled No. 1	.35	@	.40
Solid Book Ledger	1.50	@	1.75
Ledger Stock	.45	@	.55
New B. B. Chips	.20	@	.25
Manilas—			
New Env. Cut	1.25	@	1.35
New Cuttings	1.00	@	1.05
Extra No. 1 old	.80	@	.90
Print	.35	@	.40
Bogus Wrapper	.30	@	.35
Container	.25	@	.30
Old Kraft Machine—			
Compressed bales	.60	@	.70
News—			
No. 1 White News	1.15	@	1.20
Strictly Overissue	.35	@	.40
Strictly Folded	.23	@	.28
No. 1 Mixed Paper	.15	@	.20



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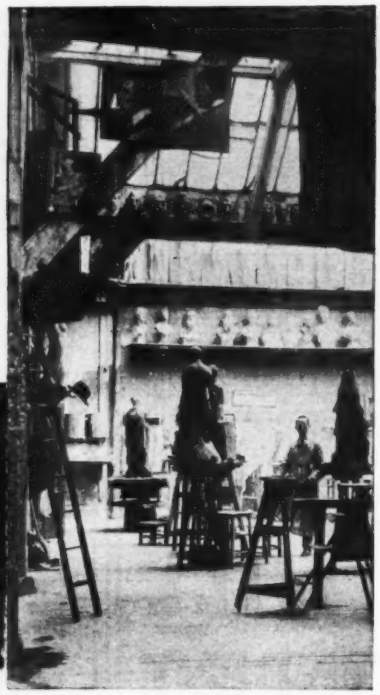

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